Red Hat Linux 7.2

The Official Red Hat Linux Itanium Installation Guide

ISBN: N/A

Red Hat, Inc.

2600 Meridian Parkway
Durham, NC 27713 USA
+1 919 547 0012 (Voice)
+1 919 547 0024 (FAX)
888 733 4281 (Voice)
P.O. Box 13588
Research Triangle Park, NC 27709 USA

© 2001 Red Hat, Inc.

rhl-ig-itanium(EN)-7.2-Print-RHI (2001-10-24T18:41-0400)

Copyright © 2001 by Red Hat, Inc. This material may be distributed only subject to the terms and conditions set forth in the Open Publication License, V1.0 or later (the latest version is presently available at http://www.opencontent.org/openpub/).

Distribution of substantively modified versions of this document is prohibited without the explicit permission of the copyright holder.

Distribution of the work or derivative of the work in any standard (paper) book form for commercial purposes is prohibited unless prior permission is obtained from the copyright holder.

Red Hat, Red Hat Network, the Red Hat "Shadow Man" logo, RPM, Maximum RPM, the RPM logo, Linux Library, PowerTools, Linux Undercover, RHmember, RHmember More, Rough Cuts, Rawhide and all Red Hat-based trademarks and logos are trademarks or registered trademarks of Red Hat, Inc. in the United States and other countries.

Linux is a registered trademark of Linus Torvalds.

Motif and UNIX are registered trademarks of The Open Group.

Itanium is a registered trademark of Intel Corporation.

Netscape is a registered trademark of Netscape Communications Corporation in the United States and other countries.

Windows is a registered trademark of Microsoft Corporation.

SSH and Secure Shell are trademarks of SSH Communications Security, Inc.

FireWire is a trademark of Apple Computer Corporation.

S/390 and zSeries are trademarks of International Business Machines Corporation.

All other trademarks and copyrights referred to are the property of their respective owners.

Printed in Canada, Ireland, and Japan

Contents

Red Hat Linux 7.2

Introduction vii
- Document Conventions vii
- How to Use This Manual x

Chapter 1 Steps to Get You Started 13
- 1.1 Do You Have the Right Red Hat Linux Components? 13
- 1.2 Is Your Hardware Compatible? 14
- 1.3 Do You Have Enough Disk Space? 14
- 1.4 Which Installation Class is Best For You? 15

Chapter 2 Before You Begin the Installation Process 21
- 2.1 Installation Overview 21
- 2.2 The EFI Shell 21

Chapter 3 Installing Red Hat Linux 25
- 3.1 The Installation Program User Interface 25
- 3.2 Selecting an Installation Method 26
- 3.3 Language Selection 27
- 3.4 Keyboard Configuration 28
- 3.5 Mouse Configuration 29
- 3.6 Welcome to Red Hat Linux 31
- 3.7 Install Options 31
- 3.8 Disk Partitioning Setup 32
- 3.9 Automatic Partitioning 33
- 3.10 Partitioning Your System 34
- 3.11 Partitioning with fdisk 40
- 3.12 Network Configuration 42
- 3.13 Firewall Configuration 43
- 3.14 Language Support Selection 46

3.15 Time Zone Configuration 47
3.16 Account Configuration 49
3.17 Authentication Configuration 51
3.18 Package Group Selection 53
3.19 X Configuration 57
3.20 Preparing to Install 58
3.21 Installing Packages 59
3.22 Boot Disk Creation 60
3.23 X Configuration 61
3.24 Installation Complete 64
3.25 Booting Your Machine and Post-Installation Setup 64

Chapter 4 Installing Red Hat Linux via Text Mode 67
4.1 Things You Should Know 67
4.2 The Installation Program User Interface 69
4.3 Starting the Installation Program 71
4.4 Installation Cross-reference Table 72
4.5 Identify Disk Partition to Install From 73
4.6 Installing over a Network 74

Appendix A Upgrading Your Current System 79
A.1 What it Means to Upgrade 79
A.2 Upgrading Your System 79
A.3 Upgrading Your Filesystem 80
A.4 Customizing Your Upgrade 81
A.5 Selecting Packages to Upgrade 81
A.6 Upgrading Packages 83
A.7 Upgrade Complete 84

Appendix B Additional Resources about Itanium and Linux 85

Appendix C Getting Technical Support 87
C.1 Remember to Sign Up 87

C.2 An Overview of Red Hat Support 87
C.3 Scope of Red Hat Support 88
C.4 How to Get Technical Support 89
C.5 Questions for Technical Support 90

Appendix D Troubleshooting Your Installation of Red Hat Linux 93
D.1 You are Unable to Boot Red Hat Linux 93
D.2 Trouble Beginning the Installation 93
D.3 Trouble During the Installation 94
D.4 Problems After Installation 96

Appendix E An Introduction to Disk Partitions 99
E.1 Hard Disk Basic Concepts 99

Introduction

Welcome to the *Official Red Hat Linux Itanium Installation Guide*.

The *Official Red Hat Linux Itanium Installation Guide* contains useful information to assist you during the installation of Red Hat Linux. From fundamental concepts such as installation preparation (gathering information about your current system) to the step-by-step installation procedure, this book will be a valuable resource as you install Red Hat Linux.

This manual will walk you through a typical installation using the Red Hat Linux CD-ROMs. Once you have completed the installation as outlined in this manual, you will have a fully functioning Red Hat Linux desktop system.

Document Conventions

When you read this manual, you will see that certain words are represented in different fonts, typefaces, sizes and weights. This highlighting is systematic; different words are represented in the same style to indicate their inclusion in a specific category. The types of words that are represented this way include the following:

`command`

Linux commands (and other operating system commands, when used) are represented this way. This style should indicate to you that you can type in the word or phrase on the command line and press [Enter] to invoke a command. Sometimes a command contains words that would be displayed in a different style on their own (e.g., filenames). In these cases, they are considered to be part of the command, so the entire phrase will be displayed as a command. For example:

Use the `cat testfile` command to view the contents of a file, named `testfile`, in the current working directory.

`filename`

Filenames, directory names, paths and RPM package names are represented this way. This style should indicate that a particular file or directory exists by that name on your Red Hat Linux system. Examples:

The `.bashrc` file in your home directory contains bash shell definitions and aliases for your own use.

The `/etc/fstab` file contains information about different system devices and filesystems.

The `/usr/share/doc` directory contains documentation for various programs.

Install the `webalizer` RPM if you want to use a Web server log file analysis program.

application

This style should indicate to you that the program named is an end-user application (as opposed to system software). For example:

Use Netscape Navigator to browse the Web.

[key]

A key on the keyboard is shown in this style. For example:

To use [Tab] completion, type in a character and then press the [Tab] key. Your terminal will display the list of files in the directory that start with that letter.

[key]-[combination]

A combination of keystrokes is represented in this way. For example:

The [Ctrl]-[Alt]-[Backspace] key combination will restart the X Window System.

text found on a GUI interface

A title, word or phrase found on a GUI interface screen or window will be shown in this style. When you see text shown in this style, it is being used to identify a particular GUI screen or an element on a GUI screen (e.g., text associated with a checkbox or field). Examples:

On the GNOME **Control Center** screen, you can customize your GNOME window manager.

Select the **Require Password** checkbox if you would like your screensaver to require a password before stopping.

top level of a menu on a GUI screen or window

When you see a word in this style, it indicates that the word is the top level of a pulldown menu. If you click on the word on the GUI screen, the rest of the menu should appear. For example:

Under **Settings** on a GNOME terminal, you will see the following menu items: **Preferences**, **Reset Terminal**, **Reset and Clear**, and **Color selector**.

If you need to type in a sequence of commands from a GUI menu, they will be shown like the following example:

Click on **Programs**=>**Applications**=>**Emacs** to start the Emacs text editor.

button on a GUI screen or window

This style indicates that the text will be found on a clickable button on a GUI screen. For example:

Click on the **Back** button to return to the Web page you last viewed.

`computer output`

When you see text in this style, it indicates text displayed by the computer on the command line. You will see responses to commands you typed in, error messages and interactive prompts for your input during scripts or programs shown this way. For example:

Use the `ls` to display the contents of a directory:

```
$ ls
Desktop                 axhome          logs          paulwesterberg.gif
Mail                    backupfiles     mail          reports
```

The output returned in response to the command (in this case, the contents of the directory) is shown in this style.

`prompt`

A prompt, which is a computer's way of signifying that it is ready for you to input something, will be shown in this style. Examples:

```
$
```

```
#
```

```
[stephen@maturin stephen]$
```

```
leopard login:
```

`user input`

Text that the user has to type, either on the command line, or into a text box on a GUI screen, is displayed in this style. In the following example, **`text`** is displayed in this style:

To boot your system into the text based installation program, you will need to type in the **`text`** command at the `boot:` prompt.

Another example, with the word **`root`** displayed as something the user needs to type in:

If you need to log in as root when you first log into your system, and you are using the graphical login screen, at the `Login` prompt, type **`root`**. At the `Password` prompt, type in the root password.

Additionally, we use several different strategies to draw your attention to certain pieces of information. In order of how critical the information is to your system, these items will be marked as a note, a caution or a warning. For example:

Note

Remember that Linux is case sensitive. In other words, a rose is not a ROSE is not a rOsE.

Do not do routine tasks as root — use a regular user account unless you need to use the root account to administer your system.

If you choose not to partition manually, a server installation will remove all existing partitions on all installed hard drives. Do not choose this installation class unless you are sure you have no data you need to save.

How to Use This Manual

This manual focuses on a CD-ROM based installation, so it is ideal for users (both new and old) who want a quick and simple installation solution. It will help you prepare your system, walk you through the installation, and assist you in the configuration of Red Hat Linux.

Note

If you currently use Red Hat Linux 3.0.3 (or greater), you can perform an upgrade. Skim Chapter 1, *Steps to Get You Started* to review the basics, then read Chapter 3, *Installing Red Hat Linux*, following the directions as you go. Once you have chosen to perform an upgrade in the installation program, refer to Appendix A, *Upgrading Your Current System*.

If you are an experienced user who wants to perform a Red Hat Linux CD-ROM installation, and you do not need a review of the basics, you can skip ahead to Chapter 3, *Installing Red Hat Linux* to begin the installation process.

Tip

Refer to the **Red Hat Frequently Asked Questions** for answers to questions and problems that may occur before, during, or after the installation. You will find the FAQ online at:

http://www.redhat.com/support/docs/faqs/rhl_general_faq/

We Need Feedback!

If you spot a typo in the *Official Red Hat Linux Itanium Installation Guide*, or if you have thought of a way to make this manual better, we would love to hear from you! Please submit a report in Bugzilla (http://www.redhat.com/bugzilla/) against the component *rhl-ig-itanium*.

Be sure to mention the manual's identifier:

```
rhl-ig-itanium(EN)-7.2-Print-RHI (2001-10-24T18:41-0400)
```

That way we will know exactly which version of the guide you have.

If you have a suggestion for improving the documentation, try to be as specific as possible when describing it. If you have found an error, please include the section number and some of the surrounding text so we can find it easily.

If you have a support question (for example, if you need help configuring X, or if you are not sure how to partition your hard drive[s]), please register your product at http://www.redhat.com/apps/activate/ and use the online support system for those type of requests.

1 Steps to Get You Started

Before you install Red Hat Linux, you will need to perform the following steps:

1.1 Do You Have the Right Red Hat Linux Components?

If you have purchased the Official Red Hat Linux boxed set, you are ready to go. However, mistakes occasionally happen, so now is a good time to double-check the contents of your boxed set.

A black, red, and white Registration Information card is included in your boxed set. A list of the contents of your boxed set version is on the back of the card. Please read over the list and check to make sure that you have all the CDs and manuals that are included with the version of Red Hat Linux that you purchased.

If you have purchased the Official Red Hat Linux boxed set from Red Hat, Inc. (or one of its distributors), and you are missing one or more of the items listed, please let us know. Contact information is also available on the Registration Information card.

How to identify our official boxed set: The bottom of our box has an ISBN number next to one of the bar codes. That ISBN number should be in this form:

`1-58569-`*`x`*`-`*`y`*

(The *x* and *y* will be unique numbers.)

Red Hat partners with companies (international and domestic) so that we can make Red Hat Linux available to you in the most convenient form. Because of these partnerships, you might find that your Red Hat Linux boxed set may not have been actually produced by Red Hat.

If your box has a different ISBN number (or none at all), you will need to contact the company that produced your boxed set. Normally, third-party producers will include their logo and/or contact information on the outside of the box; an official Red Hat Linux boxed set lists only our name and contact information.

1.1.1 Where to Find Other Red Hat Linux Manuals

If your particular boxed set did not include all of the printed Red Hat Linux manuals, you can find them online or on the Red Hat Linux Documentation CD.

To find the manuals in both HTML and PDF formats online, go to http://www.redhat.com/docs.

1.1.2 Why You Should Register Your Red Hat Linux Boxed Set

If you have purchased an Official Red Hat Linux 7.2 boxed set, you should register your product. Registration offers many useful services, such as installation support, access to Red Hat Network, and more.

To register your product, go to http://www.redhat.com/apps/activate/. You will find your *Product ID* on the Registration Information card in your Official Red Hat Linux boxed set. Once registered, you will have access to all the extras that Red Hat provides to its registered users.

For more information on registering and the scope of Red Hat's technical support offerings, see Appendix C, *Getting Technical Support*.

1.1.3 No Boxed Set? No Problem!

Of course, not everyone purchases a Red Hat Linux boxed set. It is entirely possible to install Red Hat Linux using a CD created by another company, or even via FTP. In these cases, you may need to create one or more diskettes to get started.

For information on downloading and installing Red Hat Linux, refer to http://www.redhat.com/download/howto_download.html.

For people installing Red Hat Linux from a CD-ROM not from Red Hat, you may need a boot disk. It may also be able to start the installation directly from the CD. We will discuss this in more detail when we outline the various installation methods.

For information on making diskettes, see *Booting the Installation Program from an LS-120 Diskette* in Section 2.2.3.

1.2 Is Your Hardware Compatible?

Hardware compatibility is particularly important if you have an older system or a system that you built yourself. Red Hat Linux 7.2 should be compatible with most hardware in systems that were factory built within the last two years. However, hardware specifications change almost daily, so it is hard to guarantee that your hardware will be 100% compatible.

The most recent list of supported hardware can be found at http://hardware.redhat.com.

1.3 Do You Have Enough Disk Space?

Nearly every modern-day operating system (OS) uses **disk partitions**, and Red Hat Linux is no exception. When you install Red Hat Linux, you may have to work with disk partitions. If you have not

worked with disk partitions before (or need a quick review of the basic concepts) read Appendix E, *An Introduction to Disk Partitions* before proceeding.

The disk space used by Red Hat Linux must be separate from the disk space used by other OSes you may have installed on your system. At least three partitions (`/`, `/boot/efi`, and `swap`) must be dedicated to Red Hat Linux.

Before you start the installation process, one of the following conditions must be met:

- Your computer must have enough *unpartitioned* disk space for the installation of Red Hat Linux.
- You must have one or more partitions that may be deleted, thereby freeing up enough disk space to install Red Hat Linux.

1.3.1 Installation Disk Space Requirements

Note

These recommendations are based on an installation that only installs one language (such as English). If you plan to install multiple languages to use on your system, you should increase the disk space requirements.

Workstation

A workstation installation, choosing to install GNOME or KDE, requires at least 1.5 GB of free space. Choosing both GNOME and KDE requires at least 1.8 GB of free disk space.

Server

A server installation requires 1 GB for a minimal installation without X (the graphical environment), at least 1.3 GB of free space if all components (package groups) other than X are installed, and at least 2.0 GB to install all packages including GNOME and KDE.

Custom

A custom installation requires 1.1 GB for a minimal installation and at least 4.5 GB of free space if every package is selected.

If you are not sure that you meet these conditions, or if you want to know how to create free disk space for your Red Hat Linux installation, please refer to Appendix E, *An Introduction to Disk Partitions*.

1.4 Which Installation Class is Best For You?

Usually, Red Hat Linux is installed on its own disk partition or set of partitions, or over another installation of Linux.

WARNING

Installing Red Hat Linux over another installation of Linux (including Red Hat Linux) does *not* preserve any information (files or data) from a prior installation. Make sure you save any important files! To preserve the current data on your existing system, you should back up your data and/or consider performing an upgrade instead.

Red Hat Linux provides four different classes, or types, of installations:

Workstation

A workstation installation is most appropriate if you are new to the world of Linux, and would like to give it a try. A workstation installation will create a system for your home or desktop use. A graphical, Windows-like environment will be installed.

Server

A server installation is most appropriate for you if you would like your system to function as a Linux-based server, and you do not want to heavily customize your system configuration.

Custom

A custom installation allows you the greatest flexibility during your installation. You choose your boot loader, which packages you want, and more. Custom installations are most appropriate for those users more familiar with Red Hat Linux installations and for those afraid of losing complete flexibility.

Upgrade

If you already have a version of Red Hat Linux running on your system and you want to quickly update to the latest packages and kernel version, then an upgrade is most appropriate for you.

These classes give you the option of simplifying the installation process (with some potential for loss of configuration flexibility), or retaining flexibility with a slightly more complex installation process. Next, take a detailed look at each class, so you can see which one is right for you.

1.4.1 Workstation Installations

Most suitable for new users, the workstation installation will install your choice of the GNOME or KDE desktop environments, or both, and the X Window System (the graphical environment).

Below are the minimum recommended disk space requirements for a workstation installation where only one language (such as English) will be installed.

- Workstation choosing GNOME or KDE : 1.5 GB
- Workstation choosing both GNOME and KDE, and games: 1.8 GB

If you plan to choose all group packages (for example, GNOME is a group of packages), as well as select additional individual packages, you may want to allow yourself 1.8 GB or more of disk space. If you provide this extra space, you will have room for additional data, if needed.

Note

Unlike workstation installations previous to Red Hat Linux 7.0, performing a Red Hat Linux 7.2 workstation installation will not install the network daemon xinetd (inet services). When xinetd is not installed, you will have a more secure installation. However,in-bound network-related services such as finger, telnet, talk, and FTP will not work.[1] If you require these types of services, please go back and choose a server or a custom installation.

What a Workstation Installation Will Do

If you choose automatic partitioning, a workstation installation will create the following partitions:

- A 100 MB partition (mounted as `/boot/efi` and formatted as type vfat) in which the Linux kernel, the ELILO configuration files, and other related files reside.
- The size of the swap partition is determined by the amount of RAM in your system and the amount of space available on your hard drive. For example, if you have 128 MB of RAM then the swap partition created can be 128 MB - 256 MB (twice your RAM), depending on how much disk space is available.
- A root partition (mounted as `/`) in which all other files are stored (the exact size of this partition is dependent on your available disk space).

1.4.2 Server Installations

A server installation is most appropriate for you if you would like your system to function as a Linux-based server, and you do not want to heavily customize your system configuration.

Below are the minimum recommended disk space requirements for a server installation where only one language (such as English) will be installed.

- Server (minimum, no graphical interface): 1 GB
- Server (choosing everything, no graphical interface): 1.3 GB

[1] For example, you can `telnet` out to other systems, but other systems cannot `telnet` in to your system.

- Server (choosing everything, GNOME and KDE): 2.0 GB

If you plan to choose all group packages, as well as select additional individual packages, you may want to allow yourself 2.0 GB or more of disk space. This will provide space where additional data may be written.

What a Server Installation Will Do

During the server installation, *the X Window System is not configured and no GUI will be loaded* when the system boots, unless you choose to install the appropriate packages during package selection.

- A 100 MB partition (mounted as `/boot/efi` and formatted as type vfat) in which the Linux kernel, ELILO configuration files, and other related files are kept.
- The size of the swap partition is determined by the amount of RAM in your system and the amount of space available on your hard drive. For example, if you have 128 MB of RAM then the swap partition created can be 128 MB - 256 MB (twice your RAM), depending on how much disk space is available.
- A partition of at least 1400 MB (mounted as `/usr`).
- A partition of at least 512 MB (mounted as `/home`).
- A 256 MB partition (mounted as `/var`).
- A partition of at least 384 MB (mounted as `/`) in which all other files are stored (the exact size of this partition is dependent on your available disk space).

This disk partitioning scheme results in a reasonably flexible filesystem configuration for most server tasks.

1.4.3 Custom Installations

The *custom installation* allows you the most flexibility during your installation. The workstation and server installations automatically go through the installation process for you and omit certain steps. During a custom installation, you have complete control over the packages that will be installed on your system.

The recommended disk space requirements for a custom installation are as follows:

- Custom (minimum): 1.1 GB
- Custom (choosing everything): 3.4 GB

What a Custom Installation Will Do

As you might guess from the name, a custom installation puts the emphasis on flexibility. You have complete control over which packages will be installed on your system.

If you choose automatic partitioning, a custom installation will create the following partitions:

- A 100 MB partition (mounted as `/boot/efi` and formatted as vfat) in which the Linux kernel, ELILO configuration files, and other related files reside.
- The size of the swap partition is determined by the amount of RAM in your system and the amount of space available on your hard drive. For example, if you have 128 MB of RAM then the swap partition created can be 128 MB - 256 MB (twice your RAM), depending on how much disk space is available.
- A root partition (mounted as `/`) in which all other files are stored (the exact size of this partition is dependent on your available disk space).

1.4.4 Upgrading Your System

Upgrading Red Hat Linux will not delete any existing data. The installation program updates the modular kernel and all currently installed software packages. See Chapter 3, *Installing Red Hat Linux* and Appendix A, *Upgrading Your Current System* for those instructions.

2 Before You Begin the Installation Process

2.1 Installation Overview

Installing Red Hat Linux on an Itanium system is different from installing Red Hat Linux on an x86 or Alpha machine. In general, the sequence of steps to a successful installation are the following:

1. Boot into the Extensible Firmware Interface (EFI) Shell.
2. If you can't boot from the CD-ROM, make an LS-120 diskette from the boot image file provided with Red Hat Linux.
3. Using the EFI Shell and the ELILO bootloader, load and run the kernel, and boot into the Red Hat Linux installation program.

2.1.1 Disk Space Requirements

Before you begin the installation, be aware that you'll need certain amounts of free disk space to install Red Hat Linux.

- At minimum, you'll need 512 MB of RAM and 1 GB of free hard disk space to install Red Hat Linux.
- You should have 1024 MB of RAM and 4 GB or more of free hard disk space on your machine for a full installation of Red Hat Linux.

Depending upon what type of installation you are performing, you may need an LS-120 diskette.

2.2 The EFI Shell

Before you start to install Red Hat Linux on an Itanium, you'll need a basic understanding of the EFI Shell, what it does, and the information it can provide.

The EFI Shell is a console interface used to launch applications (such as the Red Hat Linux installation program), load EFI protocols and device drivers, and execute simple scripts. It is similar to a DOS console and can only access media that is FAT16 (vfat) formatted.

The EFI Shell also contains common utilities that can be used on the EFI system partition. These utilities include `edit`, `type`, `cp`, `rm`, and `mkdir`. To see a list of utilities and other commands, type `help` at the EFI Shell prompt.

The EFI Shell contains a bootloader called `elilo`. Additional information on EFI can be found at the following URL:

```
http://developer.intel.com/technology/efi/index.htm
```

2.2.1 EFI Device Names

The `map` command can be used to list all devices and filesystems that EFI can recognize. When your Itanium system boots into the EFI shell, it probes your system in the following order:

1. LS-120 drive (if it contains media)
2. IDE hard drives on the primary IDE interface
3. IDE hard drives on the secondary IDE interface
4. SCSI hard drives on the SCSI interface
5. CD-ROM drives on the IDE interface
6. CD-ROM drives on the SCSI interface

To view the results of this system poll, type the following command at the EFI Shell prompt:

```
Shell>map
```

The output is listed in the order the system was probed. So, all FAT16 filesystems are listed first, then IDE hard drives, then SCSI hard drives, then IDE CD-ROM drives, and finally SCSI CD-ROM drives.

For example, output of the `map` command might look like the following:

```
Device mapping table
  fs0  : VenHw(Unknown Device:00)/HD(Part1,Sig00000000)
  fs1  : VenHw(Unknown Device:80)/HD(Part1,Sig00000000)
  fs2  : VenHw(Unknown Device:FF)/CDROM(Entry1)/HD(Part1,Sig00000000)
  blk0 : VenHw(Unknown Device:00)
  blk1 : VenHw(Unknown Device:00)/HD(Part1,Sig00000000)
  blk2 : VenHw(Unknown Device:80)
  blk3 : VenHw(Unknown Device:80)/HD(Part1,Sig00000000)
  blk4 : VenHw(Unknown Device:80)/HD(Part2,Sig00000000)
  blk5 : VenHw(Unknown Device:80)/HD(Part3,Sig00000000)
  blk6 : VenHw(Unknown Device:80)/HD(Part3,Sig00000000)/HD(Part1,Sig725F7772)
  blk7 : VenHw(Unknown Device:FF)
  blk8 : VenHw(Unknown Device:FF)/CDROM(Entry1)
  blk9 : VenHw(Unknown Device:FF)/CDROM(Entry1)/HD(Part1,Sig00000000)
```

In this example, there is an LS-120 diskette in the LS-120 drive as well as a CD-ROM in the CD-ROM drive.All the listings beginning with `fs` are FAT16 file systems that EFI can read. All the listings beginning with `blk` are block devices that EFI recognizes. Both the filesystems and block devices are

listed in the order they are probed. Therefore, `fs0` is the system partition on the LS-120, `fs1` is the system partition on the hard drive, and `fs2` is the system partition on the CD-ROM.

For additional information on how to determine which devices EFI recognizes, visit this website:

```
http://developer.intel.com/software/idap/tech/video/efi/efi_shell_3.htm
```

2.2.2 EFI System Partition

When partitioning your hard drive for Linux, you must create a system partition that is FAT16 (vfat) formatted and has a mount point of `/boot/efi`. This partition will contain the installed Linux kernel(s) as well as the `elilo` configuration file (`elilo.conf`). The `elilo.conf` file contains a list of kernels from which you can boot your system.

2.2.3 Booting the Installation Program

Your Itanium system will probably be able to boot the Red Hat Linux installation program directly from the Red Hat Linux CD 1. If your Itanium cannot boot the installation program from the CD-ROM (or if you want to perform a hard drive, NFS image, FTP, or HTTP installation) you'll need to boot from a diskette. See *Booting the Installation Program from an LS-120 Diskette* in Section 2.2.3 for more information on booting from a diskette.

Booting the Installation Program from the CD-ROM

To boot from Red Hat Linux CD 1 follow these steps:

1. Remove all media except Red Hat Linux CD 1.
2. From the **Boot Option** menu choose **EFI Shell**.
3. At the `Shell>` prompt, change to the filesystem on the CD-ROM. For example, in the above sample `map` output, the system partition on the CD-ROM is `fs1`. To change to the `fs1` filesystem, you would type `fs1:` at the prompt.
4. Type `elilo linux` to boot into the installation program.
5. Go to Chapter 3, *Installing Red Hat Linux* to begin the installation.

Booting the Installation Program from an LS-120 Diskette

If your Itanium will not boot from Red Hat Linux CD 1, you will need to boot from an LS-120 diskette. If you want to perform a hard drive, NFS image, FTP, or HTTP installation, you'll need to boot from boot LS-120 diskette.

You will need to create an LS-120 boot image file diskette from the boot image file on CD 1: `images/boot.img`. To create this diskette in Linux, insert a blank LS-120 diskette and type the following command at a shell prompt:

```
dd if=boot.img of=/dev/hda bs=180k
```

Replace **`boot.img`** with the full path to the boot image file and **`/dev/hda`** with the correct device name for the LS-120 diskette drive.

If you aren't using the Red Hat Linux CD, the installation program will start in text mode. You will need to choose a few basic options for your system and then you will need to select which installation method you would like to use. See Section 3.18, *Package Group Selection* for more information on the different installation methods.

If you are using the CD-ROM to load the installation program, follow the instructions contained in Chapter 3, *Installing Red Hat Linux* to install Red Hat Linux.

To boot from an LS-120 diskette follow these steps:

1. Insert the LS-120 diskette you made from the boot image file `boot.img`. If you are performing a local CD-ROM installation but booting off the LS-120 diskette, insert the Red Hat Linux CD 1 also. If you are performing a hard drive, NFS image, FTP, or HTTP installation, you do not need the CD-ROM.
2. From the **Boot Option** menu choose **EFI Shell**.
3. At the `Shell>` prompt, change the device to the LS-120 drive by typing the command `fs0:`, using the example `map` output above.
4. Type `elilo linux` to boot into the installation program.
5. Go to Chapter 3, *Installing Red Hat Linux* to begin the installation.

Boot Loader Options

To pass options to the boot loader, enter the following at the EFI Shell prompt:

```
Shell>elilo linux option
```

Acceptable options that can be passed to the installation program are as follows:

- `text` — use text mode installation program
- `lowres` — use 640 x 480 resolution
- `dd` — use a driver disk
- `expert` — expert mode

3 Installing Red Hat Linux

This chapter explains how to install Red Hat Linux from the CD-ROM using the graphical, mouse-based installation program. The following topics are discussed:

- Getting familiar with the installation program's user interface
- Starting the installation program
- Selecting an installation method
- Configuration steps during the installation (language, keyboard, mouse, etc.)
- Finishing the installation

3.1 The Installation Program User Interface

If you have used a **graphical user interface (GUI)** before, you will be familiar with this process; simply use your mouse to navigate the screens, "click" buttons, or enter text fields. You can also navigate through the installation using the [Tab] and [Enter] keys.

Note

If you do not wish to use the GUI installation program, the text mode installation program is also available. To start the text mode installation program, type the following command at the EFI Shell prompt:

```
Shell> elilo linux text
```

3.1.1 A Note about Virtual Consoles

The Red Hat Linux installation program offers more than the dialog boxes of the installation process. Several different kinds of diagnostic messages are available to you, in addition to providing a way to enter commands from a shell prompt. The installation program displays these messages on five **virtual consoles**, among which you can switch using a single keystroke combination.

These virtual consoles can be helpful if you encounter a problem while installing Red Hat Linux. Messages displayed on the installation or system consoles can help pinpoint a problem. Please see Table 3–1, *Console, Keystrokes, and Contents* for a listing of the virtual consoles, keystrokes used to switch to them, and their contents.

Table 3–1 Console, Keystrokes, and Contents

Console	Keystrokes	Contents
1	[Ctrl]-[Alt]-[F1]	installation dialog
2	[Ctrl]-[Alt]-[F2]	shell prompt
3	[Ctrl]-[Alt]-[F3]	install log (messages from installation program)
4	[Ctrl]-[Alt]-[F4]	system-related messages
5	[Ctrl]-[Alt]-[F5]	other messages
7	[Ctrl]-[Alt]-[F7]	X graphical display

Generally, there is no reason to leave the default console (virtual console #7) unless you are attempting to diagnose installation problems.

3.2 Selecting an Installation Method

Next, you will be asked what type of installation method you wish to use. This chapter explains installation from the CD-ROM. Other installation methods are briefly discussed in Chapter 4, *Installing Red Hat Linux via Text Mode*. The following installation methods are available:

CD-ROM

If you have a CD-ROM drive and the Red Hat Linux CD-ROM, you can use this method. You will need a boot disk or a bootable CD-ROM.

Hard Drive

If you have copied the Red Hat Linux ISO images to a local hard drive, you can use this method. Refer to Chapter 4, *Installing Red Hat Linux via Text Mode* for hard drive installation instructions. You will need a boot disk.

NFS Image

If you are installing from an NFS server which is exporting the Red Hat Linux CD-ROM(s) or a mirror image of Red Hat Linux, you can use this method. You will need a network boot disk. Refer to Chapter 4, *Installing Red Hat Linux via Text Mode* for network installation instructions. Please note that NFS installations may also be performed in GUI mode.

FTP

If you are installing directly from an FTP server, use this method. You will need a network boot disk. Refer to Chapter 4, *Installing Red Hat Linux via Text Mode* for FTP installation instructions.

HTTP

If you are installing directly from an HTTP (Web) server, use this method. You will need a network boot disk. Refer to Chapter 4, *Installing Red Hat Linux via Text Mode* for HTTP installation instructions.

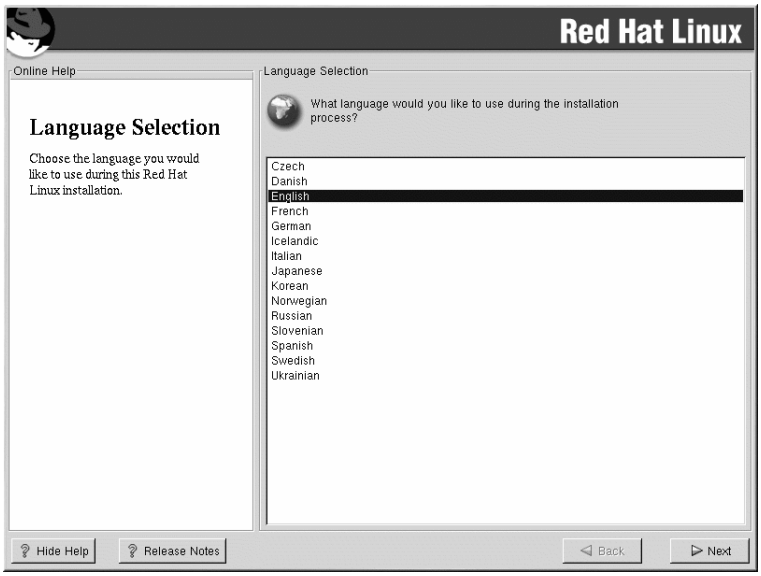
3.3 Language Selection

Using your mouse, select the language you would prefer to use for the installation and as the system default (see Figure 3–1, *Language Selection*).

Selecting the appropriate language will also help target your time zone configuration later in the installation. The installation program will try to define the appropriate time zone based on what you specify on this screen.

Once you select the appropriate language, click **Next** to continue.

Figure 3–1 Language Selection



3.4 Keyboard Configuration

Choose the keyboard model that best fits your system (see Figure 3–2, *Keyboard Configuration*). If you cannot find an exact match, choose the best **Generic** match for your keyboard type (for example, **Generic 101-key PC**).

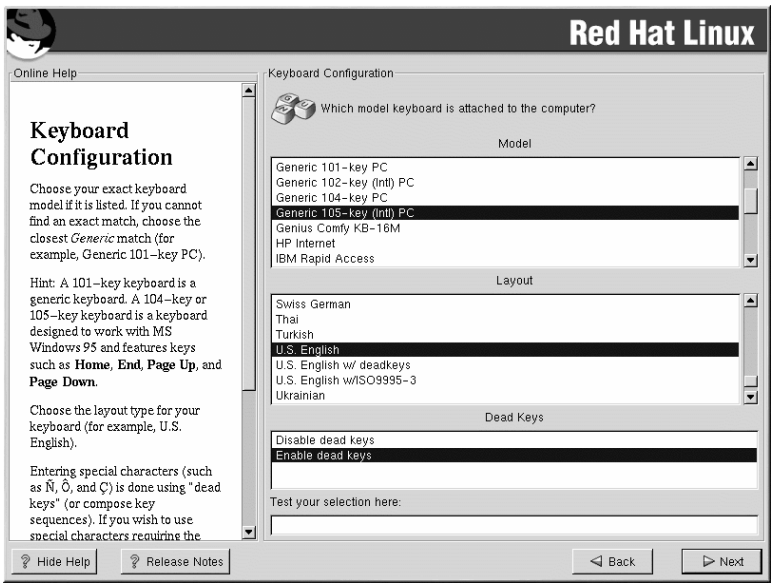
Next, choose the correct layout type for your keyboard (for example, U.S. English).

Creating special characters with multiple keystrokes (such as Ñ, Ô, and Ç) is done using "dead keys" (also known as compose key sequences). Dead keys are enabled by default. If you do not wish to use them, select **Disable dead keys**.

To test your keyboard configuration, use the blank text field at the bottom of the screen to enter text.

Once you have made the appropriate selections, click **Next** to continue.

Figure 3–2 Keyboard Configuration


Red Hat Linux
Online Help
Keyboard Configuration
Choose your exact keyboard model if it is listed. If you cannot find an exact match, choose the closest Generic match (for example, Generic 101–key PC).
Hint: A 101–key keyboard is a generic keyboard. A 104–key or 105–key keyboard is a keyboard designed to work with MS Windows 95 and features keys such as Home, End, Page Up, and Page Down.
Choose the layout type for your keyboard (for example, U.S. English).
Entering special characters (such as Ñ, Ô, and Ç) is done using "dead keys" (or compose key sequences). If you wish to use special characters requiring the
Keyboard Configuration
Which model keyboard is attached to the computer?
Model
Generic 101–key PC
Generic 102–key (Intl) PC
Generic 104–key PC
Generic 105–key (Intl) PC
Genius Comfy KB–16M
HP Internet
IBM Rapid Access
Layout
Swiss German
Thai
Turkish
U.S. English
U.S. English w/ deadkeys
U.S. English w/ISO9995–3
Ukrainian
Dead Keys
Disable dead keys
Enable dead keys
Test your selection here:
Hide Help
Release Notes
Back
Next

Tip

To change your keyboard type after you have installed Red Hat Linux, as root use the `/usr/sbin/kbdconfig` command. Alternatively, you can type `setup` at the `root` prompt.

To become root, type `su -` at the shell prompt in a terminal window and then press [Enter]. Then, enter the root password and press [Enter].

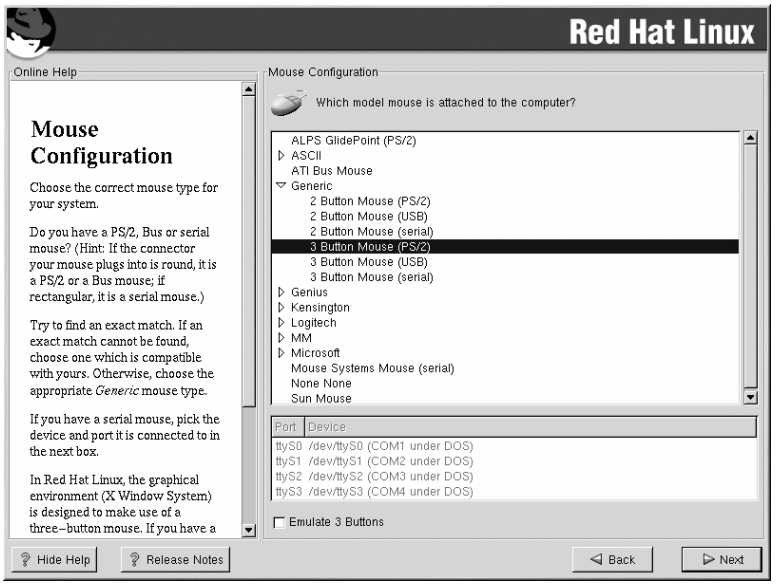
3.5 Mouse Configuration

Choose the correct mouse type for your system. If you cannot find an exact match, choose a mouse type that you are sure is compatible with your system (see Figure 3–3, *Mouse Configuration*).

To determine your mouse's interface, follow the mouse cable back to where it plugs into your system. If the connector at the end of the mouse cable plugs into a rectangular connector, you have a serial mouse; if the connector is round, you have a PS/2 mouse.

If you cannot find a mouse that you are sure is compatible with your system, select one of the **Generic** entries, based on your mouse's number of buttons, and its interface.

Figure 3–3 Mouse Configuration


Red Hat Linux
Online Help
Mouse Configuration
Choose the correct mouse type for your system.
Do you have a PS/2, Bus or serial mouse? (Hint: If the connector your mouse plugs into is round, it is a PS/2 or a Bus mouse; if rectangular, it is a serial mouse.)
Try to find an exact match. If an exact match cannot be found, choose one which is compatible with yours. Otherwise, choose the appropriate Generic mouse type.
If you have a serial mouse, pick the device and port it is connected to in the next box.
In Red Hat Linux, the graphical environment (X Window System) is designed to make use of a three–button mouse. If you have a
Mouse Configuration
Which model mouse is attached to the computer?
ALPS GlidePoint (PS/2)
ASCII
ATI Bus Mouse
Generic
2 Button Mouse (PS/2)
2 Button Mouse (USB)
2 Button Mouse (serial)
3 Button Mouse (PS/2)
3 Button Mouse (USB)
3 Button Mouse (serial)
Genius
Kensington
Logitech
MM
Microsoft
Mouse Systems Mouse (serial)
None None
Sun Mouse
Port
Device
ttyS0 /dev/ttyS0 (COM1 under DOS)
ttyS1 /dev/ttyS1 (COM2 under DOS)
ttyS2 /dev/ttyS2 (COM3 under DOS)
ttyS3 /dev/ttyS3 (COM4 under DOS)
Emulate 3 Buttons
Hide Help
Release Notes
Back
Next

If you have a PS/2 or a bus mouse, you do not need to pick a port and device. If you have a serial mouse, you should choose the correct port and device that your serial mouse is on.

The **Emulate 3 Buttons** checkbox allows you to use a two-button mouse as if it had three buttons. In general, the X Window System is easier to use with a three-button mouse. If you select this checkbox, you can emulate a third, "middle" button by pressing both mouse buttons simultaneously.

Tip

To change your mouse configuration after you have completed the installation of Red Hat Linux, become root; then use the `/usr/sbin/mouseconfig` command from a shell prompt.

To configure your mouse to work as a left-handed mouse, reset the order of the mouse buttons. To do this, after you have booted your Red Hat Linux system, type `gpm -B 321` at the shell prompt.

3.6 Welcome to Red Hat Linux

The **Welcome** screen does not prompt you for any input. Please read over the help text in the left panel for additional instructions and information on where to register your Official Red Hat Linux product.

Please notice the **Hide Help** button at the bottom left corner of the screen. The help screen is open by default. If you do not want to view the help information, click on **Hide Help** to minimize the help portion of the screen.

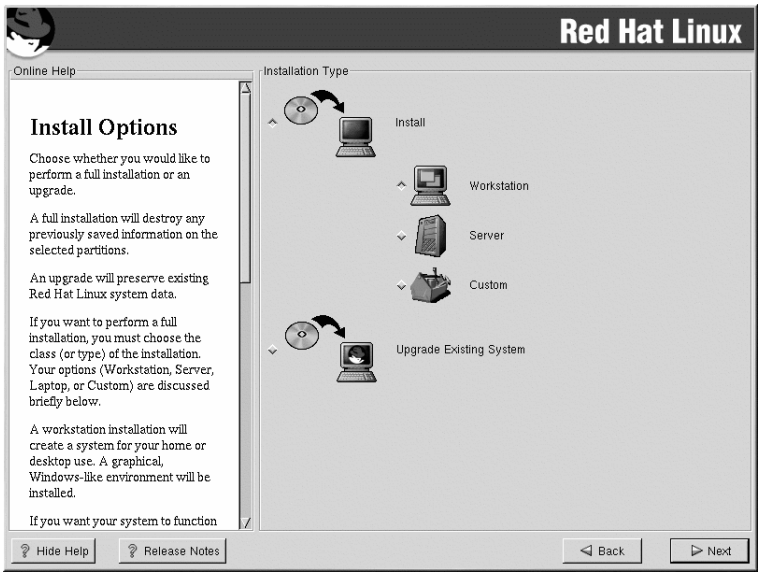
Click on the **Next** button to continue.

3.7 Install Options

Choose whether you would like to perform a full installation or an upgrade (see Figure 3–4, *Choosing Install or Upgrade*).

Red Hat Linux allows you to choose the installation type that best fits your needs. Your options are **Workstation**, **Server**, **Custom**, and **Upgrade**.

Figure 3–4 Choosing Install or Upgrade


Red Hat Linux
Online Help
Install Options
Choose whether you would like to perform a full installation or an upgrade.
A full installation will destroy any previously saved information on the selected partitions.
An upgrade will preserve existing Red Hat Linux system data.
If you want to perform a full installation, you must choose the class (or type) of the installation. Your options (Workstation, Server, Laptop, or Custom) are discussed briefly below.
A workstation installation will create a system for your home or desktop use. A graphical, Windows-like environment will be installed.
If you want your system to function
Installation Type
Install
Workstation
Server
Custom
Upgrade Existing System
Hide Help
Release Notes
Back
Next

To perform an upgrade, please refer to Appendix A, *Upgrading Your Current System*.

For more information about the different installation classes, please refer to Section 1.4, *Which Installation Class is Best For You?*.

3.8 Disk Partitioning Setup

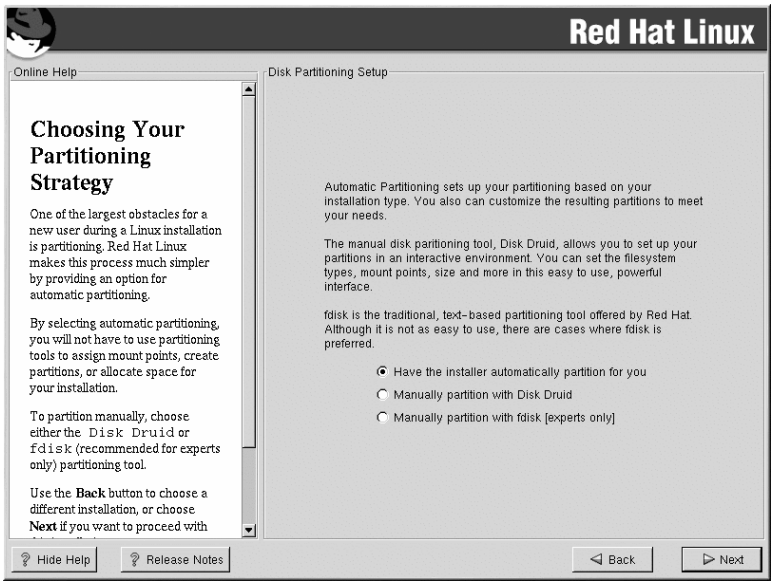
Partitioning allows you to divide your hard drive into isolated sections, where each section behaves as its own hard drive. Partitioning is particularly useful if you run more than one operating system. If you are not sure how you want your system to be partitioned, read Appendix E, *An Introduction to Disk Partitions* for more information.

In this screen, you can choose to perform automatic partitioning, to partition manually using Disk Druid, or to partition manually using fdisk (see Figure 3–5, *Disk Partitioning Setup*).

Automatic partitioning allows you to perform an installation without having to partition your drive(s) yourself. If you do not feel comfortable with partitioning your system, it is recommended that you *do not* choose to partition manually and instead let the installation program partition for you.

To partition manually, choose either the Disk Druid or fdisk (recommended for experts only) partitioning tool.

Figure 3–5 Disk Partitioning Setup

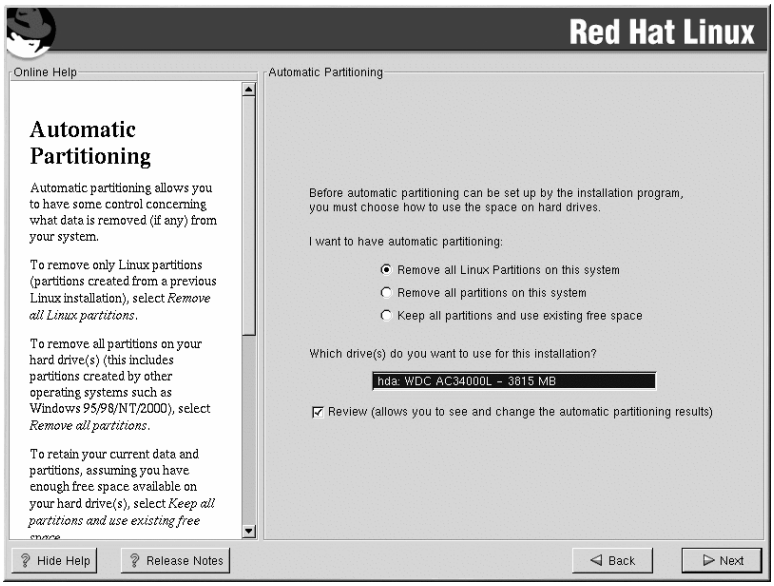

Red Hat Linux
Online Help
Choosing Your Partitioning Strategy
One of the largest obstacles for a new user during a Linux installation is partitioning. Red Hat Linux makes this process much simpler by providing an option for automatic partitioning.
By selecting automatic partitioning, you will not have to use partitioning tools to assign mount points, create partitions, or allocate space for your installation.
To partition manually, choose either the Disk Druid or fdisk (recommended for experts only) partitioning tool.
Use the Back button to choose a different installation, or choose Next if you want to proceed with
Disk Partitioning Setup
Automatic Partitioning sets up your partitioning based on your installation type. You also can customize the resulting partitions to meet your needs.
The manual disk paritioning tool, Disk Druid, allows you to set up your partitions in an interactive environment. You can set the filesystem types, mount points, size and more in this easy to use, powerful interface.
fdisk is the traditional, text-based partitioning tool offered by Red Hat. Although it is not as easy to use, there are cases where fdisk is preferred.
Have the installer automatically partition for you
Manually partition with Disk Druid
Manually partition with fdisk [experts only]
Hide Help
Release Notes
Back
Next

3.9 Automatic Partitioning

If you chose to manually partition using Disk Druid, refer to Section 3.10, *Partitioning Your System*.

If you chose to manually partition using fdisk, refer to Section 3.11, *Partitioning with fdisk*.

Figure 3–6 Automatic Partitioning


Red Hat Linux
Online Help
Automatic Partitioning
Automatic Partitioning
Automatic partitioning allows you to have some control concerning what data is removed (if any) from your system.
To remove only Linux partitions (partitions created from a previous Linux installation), select Remove all Linux partitions.
To remove all partitions on your hard drive(s) (this includes partitions created by other operating systems such as Windows 95/98/NT/2000), select Remove all partitions.
To retain your current data and partitions, assuming you have enough free space available on your hard drive(s), select Keep all partitions and use existing free space.
Automatic Partitioning
Before automatic partitioning can be set up by the installation program, you must choose how to use the space on hard drives.
I want to have automatic partitioning:
Remove all Linux Partitions on this system
Remove all partitions on this system
Keep all partitions and use existing free space
Which drive(s) do you want to use for this installation?
hda: WDC AC34000L - 3815 MB
Review (allows you to see and change the automatic partitioning results)
Hide Help
Release Notes
Back
Next

Automatic partitioning allows you to have some control concerning what data is removed (if any) from your system. Your options are:

- **Remove all Linux partitions on this system** — select this option to remove only Linux partitions (partitions created from a previous Linux installation). This will not remove other partitions you may have on your hard drive(s).
- **Remove all partitions on this system** — select this option to remove all partitions on your hard drive(s) (this includes partitions created by other operating systems such as Windows 95/98/NT/2000).

If you select this option, all data on the selected hard drive(s) will be removed by the installation program. Do not select this option if you have information that you want to keep on the hard drive(s) where you are installing Red Hat Linux.

- **Keep all partitions and use existing free space** — select this option to retain your current data and partitions, assuming you have enough free space available on your hard drive(s).

Using your mouse, choose the hard drive(s) on which you want Red Hat Linux to be installed. If you have two or more hard drives, you can choose which hard drive(s) should contain this installation. Unselected hard drives, and any data on them, will not be touched.

To review and make any necessary changes to the partitions created by automatic partitioning, select the **Review** option.

After selecting **Review** and clicking **Next** to move forward, you will see the partitions created for you in Disk Druid. You will also be able to make modifications to these partitions if they do not meet your needs.

Click **Next** once you have made your selections to proceed.

3.10 Partitioning Your System

If you chose automatic partitioning and did not select **Review**, please skip ahead to Section 3.12, *Network Configuration*.

If you chose automatic partitioning and selected **Review**, you can either accept the current partition settings (click **Next**), or modify the setup using Disk Druid, the manual partitioning tool.

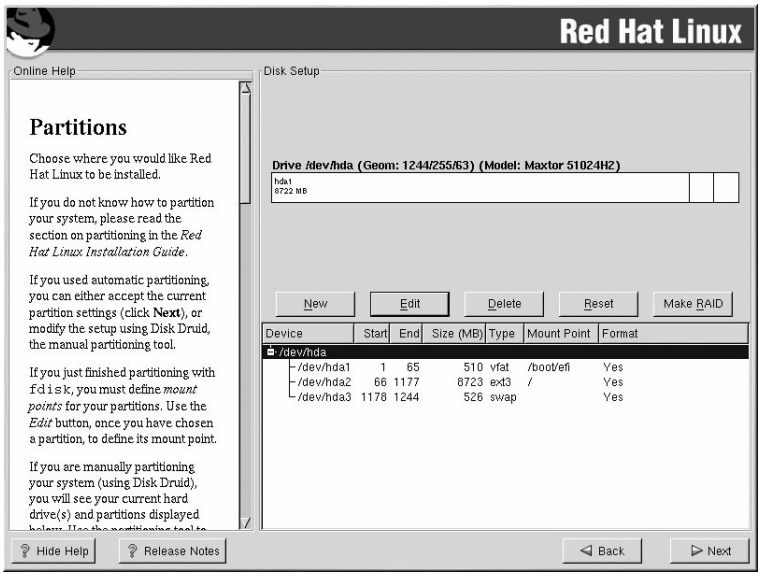
If you chose **Manually partition with fdisk**, please skip ahead to Section 3.11, *Partitioning with fdisk*.

At this point, you must tell the installation program where to install Red Hat Linux. This is done by defining mount points for one or more disk partitions in which Red Hat Linux will be installed. You may also need to create and/or delete partitions at this time (refer to Figure 3–7, *Partitioning with Disk Druid*).

Note

If you have not yet planned how you will set up your partitions, refer to Appendix E, *An Introduction to Disk Partitions*. At a bare minimum, you will need a `/boot/efi` partition of approximately 100 MB and of type vfat, a swap partition of at least 512 MB, and an appropriately-sized root (`/`) partition.

Figure 3–7 Partitioning with Disk Druid


Red Hat Linux
Online Help
Partitions
Choose where you would like Red Hat Linux to be installed.
If you do not know how to partition your system, please read the section on partitioning in the Red Hat Linux Installation Guide.
If you used automatic partitioning, you can either accept the current partition settings (click Next), or modify the setup using Disk Druid, the manual partitioning tool.
If you just finished partitioning with fdisk, you must define mount points for your partitions. Use the Edit button, once you have chosen a partition, to define its mount point.
If you are manually partitioning your system (using Disk Druid), you will see your current hard drive(s) and partitions displayed
Disk Setup
Drive /dev/hda (Geom: 1244/255/63) (Model: Maxtor 51024H2)
hda1
8722 MB
New
Edit
Delete
Reset
Make RAID
Device Start End Size (MB) Type Mount Point Format
/dev/hda
/dev/hda1 1 65 510 vfat /boot/efi Yes
/dev/hda2 66 1177 8723 ext3 / Yes
/dev/hda3 1178 1244 526 swap Yes
Hide Help
Release Notes
Back
Next

The partitioning tool used in Red Hat Linux 7.2 is Disk Druid. With the exception of certain esoteric situations, Disk Druid can handle the partitioning requirements for a typical Red Hat Linux installation.

3.10.1 Graphical Display of Hard Drive(s)

Disk Druid offers a graphical representation of your hard drive(s).

Using your mouse, click once to highlight a particular field in the graphical display. Double-click to edit an existing partition or to create a partition out of existing free space.

Above the display, you will see the **drive** name (such as /dev/hda), the **geom** (which shows the hard disk's geometry and consists of three numbers representing the number of cylinders, heads, and sectors as reported by the hard disk), and the **model** of the hard drive as detected by the installation program.

3.10.2 Disk Druid's Buttons

These buttons control Disk Druid's actions. They are used to add and delete partitions, and to change partition attributes. Buttons on this screen are also used to accept the changes you have made, or to exit Disk Druid. For further explanation, take a look at each button in order.

- **New**: Used to request a new partition. When selected, a dialog box appears containing fields (such as mount point and size) that must be filled in.
- **Edit**: Used to modify attributes of the partition currently selected in the **Partitions** section. Selecting **Edit** opens a dialog box. Some or all of the fields can be edited, depending on whether the partition information has already been written to disk.

  You can also edit free space as represented in the graphical display to create a new partition within that space. Either highlight the free space and then select the **Edit** button, or double-click on the free space to edit it.
- **Delete**: Used to remove the partition currently highlighted in the **Current Disk Partitions** section. You will be asked to confirm the deletion of any partition.
- **Reset**: Used to restore Disk Druid to its original state. All changes made will be lost if you **Reset** the partitions.
- **Make RAID**: **Make RAID** can be used if you want to provide redundancy to any or all disk partitions. *It should only be used if you have experience using RAID.* To read more about RAID, please refer to *RAID (Redundant Array of Independent Disks)* in the *Official Red Hat Linux Customization Guide*.

  To make a RAID device, you must first create software RAID partitions. Once you have created two or more software RAID partitions, select **Make RAID** to join the software RAID partitions into a RAID device.

3.10.3 Partition Fields

Above the partition hierarchy are labels which present information about the partitions you are creating. The labels are defined as follows:

- **Device**: This field displays the partition's device name.
- **Start**: This field shows the sector on your hard drive where the partition begins.
- **End**: This field shows the sector on your hard drive where the partition ends.
- **Size**: This field shows the partition's size (in MB).

- **Type**: This field shows the partition's type (for example, ext2, ext3, or vfat).
- **Mount Point**: A mount point is the location within the directory hierarchy at which a volume exists; the volume is "mounted" at this location. This field indicates where the partition will be mounted. If a partition exists, but is not set, then you need to define its mount point. Double-click on the partition or click the **Edit** button.

3.10.4 Recommended Partitioning Scheme

Unless you have a reason for doing otherwise, we recommend that you create the following partitions:

- A `/boot/efi` partition (100 MB minimum) — the partition mounted on `/boot/efi` contains all the installed kernels, the initrd images, and ELILO configuration files.

WARNING

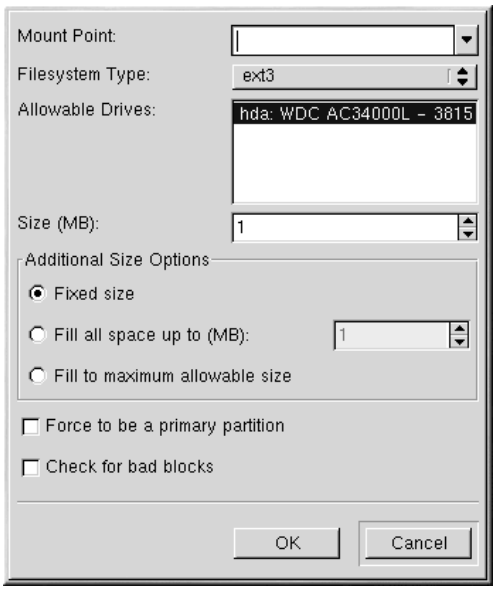
You must create a `/boot/efi` partition of type vfat and at least 100 MB in size as the first primary partition.

- A swap partition (512 MB minimum) — swap partitions are used to support virtual memory. In other words, data is written to a swap partition when there is not enough RAM to store the data your system is processing. If you are unsure about what size swap partition to create, make it twice the amount of RAM on your machine. It must be of type swap.
- A `root` partition (900 MB-4.0 GB) — this is where "`/`" (the root directory) is located. In this setup, all files (except those stored in `/boot/efi`) are on the root partition. It must be of type ext3 or ext2.

3.10.5 Adding Partitions

To add a new partition, select the **New** button. A dialog box appears (see Figure 3–8, *Creating a New Partition*).

Figure 3–8 Creating a New Partition



Note

You must dedicate at least one partition to Red Hat Linux, and optionally more. This is discussed more completely in Appendix E, *An Introduction to Disk Partitions*.

- **Mount Point**: Enter the partition's mount point. For example, if this partition should be the root partition, enter `/`; enter `/boot` for the `/boot` partition, and so on. You can also use the pulldown menu to choose the correct mount point for your partition.
- **Filesystem Type**: Using the pulldown menu, select the appropriate filesystem type for this partition. For more information on filesystem types, see *Filesystem Types* in Section 3.10.5.
- **Allowable Drives**: This field contains a list of the hard disks installed on your system. If a hard disk's box is highlighted, then a desired partition can be created on that hard disk. If the box is *not* checked, then the partition will *never* be created on that hard disk. By using different checkbox settings, you can have Disk Druid place partitions as you see fit, or let Disk Druid decide where partitions should go.

- **Size (Megs)**: Enter the size (in megabytes) of the partition. Note this field starts with a "1" in it; unless changed you will end up with a 1 MB partition.
- **Additional Size Options**: Choose whether to keep this partition at a fixed size, to allow it to "grow" (fill up the available hard drive space) to a certain point, or to allow it to grow to fill any remaining hard drive space available.

  If you choose **Fill all space up to (MB)**, you must give size constraints in the field to the right of this option. This allows you to keep a certain amount of space free on your hard drive for future use.
- **Force to be a primary partition**: Select whether the partition you are creating should be one of the first four partitions on the hard drive. If unselected, the partition created will be a logical partition. See Section E.1.3, *Partitions within Partitions -- An Overview of Extended Partitions* for more information.
- **Check for bad blocks**: Checking for bad blocks can help prevent data loss by locating the bad blocks on a drive and making a list of them to prevent using them in the future. If you wish to check for bad blocks while formatting each filesystem, please make sure to select this option.

  Selecting **Check for bad blocks** may dramatically increase your total installation time. Since most newer hard drives are quite large in size, checking for bad blocks may take a long time; the length of time depends on the size of your hard drive. If you choose to check for bad blocks, you can monitor your progress on virtual console #6.
- **Ok**: Select **Ok** once you are satisfied with the settings and wish to create the partition.
- **Cancel**: Select **Cancel** if you do not want to create the partition.

Filesystem Types

Red Hat Linux 7.2 allows you to create different types of partition types, based on the filesystem they will use. The following is a brief description of the different filesystems available, and how they can be utilized.

- **ext2** — An ext2 filesystem supports standard Unix file types (regular files, directories, symbolic links, etc). It provides the ability to assign long file names, up to 255 characters. Versions prior to Red Hat Linux 7.2 used ext2 filesystems by default.
- **ext3** — The ext3 filesystem is based on the ext2 filesystem and has one main advantage — journaling. Using a journaling filesystem reduces time spent recovering a filesystem after a crash as there is no need to fsck[1]the filesystem.

1 The fsck application is used to check and optionally repair one or more Linux filesystems.

- **software RAID** — Creating two or more software RAID partitions allow you to create a RAID device. For more information regarding RAID, refer to the chapter *RAID (Redundant Array of Independent Disks)* in the *Official Red Hat Linux Customization Guide*.
- **swap** — Swap partitions are used to support virtual memory. In other words, data is written to a swap partition when there is not enough RAM to store the data your system is processing.
- **vfat** — The VFAT filesystem is a Linux filesystem that is compatible with Windows 95/NT long filenames on the FAT filesystem. This filesystem must be used for the `/boot/efi` partition.

3.10.6 Editing Partitions

To edit a partition, select the **Edit** button or double-click on the existing partition.

Note

If the partition already exists on your hard disk, you will only be able to change the partition's mount point. If you want to make any other changes, you will need to delete the partition and recreate it.

3.10.7 Deleting a Partition

To delete a partition, highlight it in the **Partitions** section and click the **Delete** button. You will be asked to confirm the deletion.

Skip to Section 3.12, *Network Configuration* for further installation instructions.

3.11 Partitioning with fdisk

This section applies only if you chose to use fdisk to partition your system.

To partition your system without using fdisk, please skip to Section 3.9, *Automatic Partitioning* for automatic partitioning or Section 3.10, *Partitioning Your System* for partitioning with Disk Druid.

If you have already completed disk partitioning, skip to Section 3.12, *Network Configuration* for further installation instructions.

Unless you have previously used fdisk and understand how it works, we do not recommend that you use it.

Disk Druid is easier to understand than fdisk. To exit fdisk, click **Back** to return to the previous screen, deselect fdisk, and then click **Next**.

If you have chosen to use fdisk, the next screen will prompt you to select a drive to partition using fdisk. Once you have chosen which drive to partition, you will be presented with the fdisk command screen. If you do not know what command to use, type [m] at the prompt for help.

You must create a `/boot/efi` partition of type DOS as the first primary partition with the size of at least 100 MB.

When you are finished making partitions, type [w] to save your changes and quit. You will be taken back to the original fdisk screen where you can choose to partition another drive or continue with your installation.

Note

None of the changes you make take effect until you save them and exit fdisk using the `w` command. You can quit fdisk at any time without saving changes using the `q` command.

After you have partitioned your drive(s), click **Next**. You will need to use Disk Druid to assign mount points to the partitions you just created with fdisk.

You will not be able to add new partitions using Disk Druid, but you will be able to edit mount points for the partitions you have already created. For each partition created with fdisk, click on the **Edit** button, choose the appropriate mount point for that partition from the pulldown menu, and click on **OK**.

3.12 Network Configuration

If you do not have a network card, you will not see this screen. Skip ahead to Section 3.13, *Firewall Configuration*.

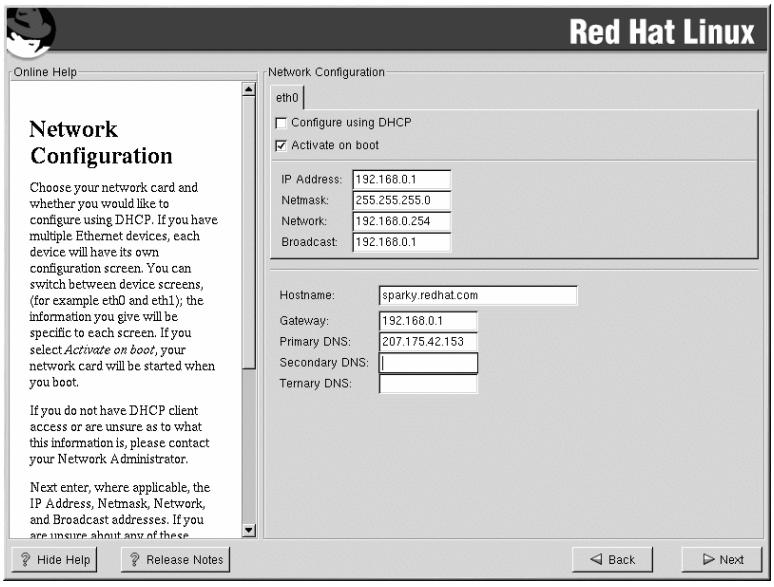
If you have a network card and you have not already configured your networking, you now have the opportunity (as shown in Figure 3–9, *Network Configuration*).

If you have multiple devices, you will see a tab for each device. You may switch between devices (for example, between eth0 and eth1) and the information you provide on each tab will be specific to each device.

Indicate if you would like to configure your IP address using DHCP (Dynamic Host Configuration Protocol). If you select **Activate on boot**, your network interface will be started when you boot. If you do not have DHCP client access or you are unsure what to provide here, please contact your network administrator.

Next enter, where applicable, the **IP Address**, **Netmask**, **Network**, and **Broadcast** addresses. If you are unsure about any of these, please contact your network administrator.

Figure 3–9 Network Configuration


Red Hat Linux
Online Help
Network Configuration
eth0
Configure using DHCP
Activate on boot
IP Address: 192.168.0.1
Netmask: 255.255.255.0
Network: 192.168.0.254
Broadcast: 192.168.0.1
Hostname: sparky.redhat.com
Gateway: 192.168.0.1
Primary DNS: 207.175.42.153
Secondary DNS:
Ternary DNS:
Network Configuration
Choose your network card and whether you would like to configure using DHCP. If you have multiple Ethernet devices, each device will have its own configuration screen. You can switch between device screens, (for example eth0 and eth1); the information you give will be specific to each screen. If you select Activate on boot, your network card will be started when you boot.
If you do not have DHCP client access or are unsure as to what this information is, please contact your Network Administrator.
Next enter, where applicable, the IP Address, Netmask, Network, and Broadcast addresses. If you
Hide Help
Release Notes
Back
Next

Note

Do not use the numbers as seen in this sample configuration. These values will not work for your own network configuration. If you are not sure what values to enter, contact your network administrator for assistance.

If you have a fully qualified domain name for the network device, enter it in the **Hostname** field.

Tip

Even if your computer is not part of a network, you can enter a hostname for your system. If you do not take this opportunity to enter in a name, your system will be known as `localhost`.

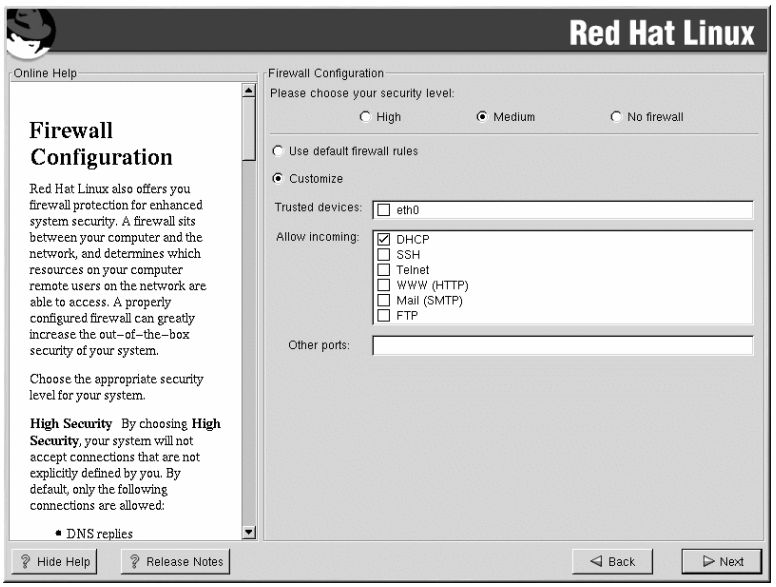
Finally, enter the **Gateway** and **Primary DNS** (and if applicable the **Secondary DNS** and **Ternary DNS**) addresses.

3.13 Firewall Configuration

Red Hat Linux offers firewall protection for enhanced system security. A firewall exists between your computer and the network, and determines which resources on your computer remote users on the network can access. A properly configured firewall can greatly increase the security of your system.

Choose the appropriate security level for your system.

Figure 3–10 Firewall Configuration


Red Hat Linux
Online Help
Firewall Configuration
Red Hat Linux also offers you firewall protection for enhanced system security. A firewall sits between your computer and the network, and determines which resources on your computer remote users on the network are able to access. A properly configured firewall can greatly increase the out–of–the–box security of your system.
Choose the appropriate security level for your system.
High Security By choosing High Security, your system will not accept connections that are not explicitly defined by you. By default, only the following connections are allowed:
• DNS replies
Firewall Configuration
Please choose your security level:
High
Medium
No firewall
Use default firewall rules
Customize
Trusted devices:
eth0
Allow incoming:
DHCP
SSH
Telnet
WWW (HTTP)
Mail (SMTP)
FTP
Other ports:
Hide Help
Release Notes
Back
Next

High

If you choose **High**, your system will not accept connections (other than the default settings) that are not explicitly defined by you. By default, only the following connections are allowed:

- DNS replies
- DHCP — so any network interfaces that use DHCP can be properly configured

If you choose **High**, your firewall will not allow the following:

- Active mode FTP (passive mode FTP, used by default in most clients, should still work)
- IRC DCC file transfers
- RealAudio™
- Remote X Window System clients

If you are connecting your system to the Internet, but do not plan to run a server, this is the safest choice. If additional services are needed, you can choose **Customize** to allow specific services through the firewall.

Medium

If you choose **Medium**, your firewall will not allow remote machines to have access to certain resources on your system. By default, access to the following resources are not allowed:

- Ports lower than 1023 — the standard reserved ports, used by most system services, such as FTP, SSH, telnet, and HTTP
- The NFS server port (2049)
- The local X Window System display for remote X clients
- The X Font server port (by default, xfs does not listen on the network, it is disabled in the font server)

If you want to allow resources such as RealAudio™, while still blocking access to normal system services, choose **Medium**. Select **Customize** to allow specific services through the firewall.

No Firewall

No firewall provides complete access to your system and does no security checking. Security checking is the disabling of access to certain services. This should only be selected if you are running on a trusted network (not the Internet) or plan to do more firewall configuration later.

Choose **Customize** to add trusted devices or to allow additional incoming services.

Trusted Devices

Selecting any of the **Trusted Devices** allows access to your system for all traffic from that device; it is excluded from the firewall rules. For example, if you are running a local network, but are connected to the Internet via a PPP dialup, you can check **eth0** and any traffic coming from your local network will be allowed. Selecting **eth0** as trusted means all traffic over the Ethernet is allowed, put the ppp0 interface is still firewalled. If you want to restrict traffic on an interface, leave it unchecked.

It is not recommended that you make any device that is connected to public networks, such as the Internet, a **Trusted Device**.

Allow Incoming

Enabling these options allow the specified services to pass through the firewall. Note, during a workstation installation, the majority of these services are *not* installed on the system.

DHCP

If you allow incoming DHCP queries and replies, you allow any network interface that uses DHCP to determine its IP address. DHCP is normally enabled. If DHCP is not enabled, your computer can no longer get an IP address.

SSH

*S*ecure *SH*ell (SSH) is a suite of tools for logging into and executing commands on a remote machine. If you plan to use SSH tools to access your machine through a firewall, enable this option. You need to have the `openssh-server` package installed in order to access your machine remotely, using SSH tools.

Telnet

Telnet is a protocol for logging into remote machines. Telnet communications are unencrypted, and provide no security from network snooping. Allowing incoming Telnet access is not recommended. If you do want to allow inbound Telnet access, you will need to install the `telnet-server` package.

WWW (HTTP)

The HTTP protocol is used by Apache (and by other Web servers) to serve Web pages. If you plan on making your Web server publicly available, enable this option. This option is not required for viewing pages locally or for developing Web pages. You will need to install the `apache` package if you want to serve Web pages.

Mail (SMTP)

If you want to allow incoming mail delivery through your firewall, so that remote hosts can connect directly to your machine to deliver mail, enable this option. You do not need to enable this if you collect your mail from your ISP's server using POP3 or IMAP, or if you use a tool such as fetchmail. Note that an improperly configured SMTP server can allow remote machines to use your server to send spam.

FTP

The FTP protocol is used to transfer files between machines on a network. If you plan on making your FTP server publicly available, enable this option. You need to install the `wu-ftpd` (and possibly the `anonftp`) package for this option to be useful.

Other ports

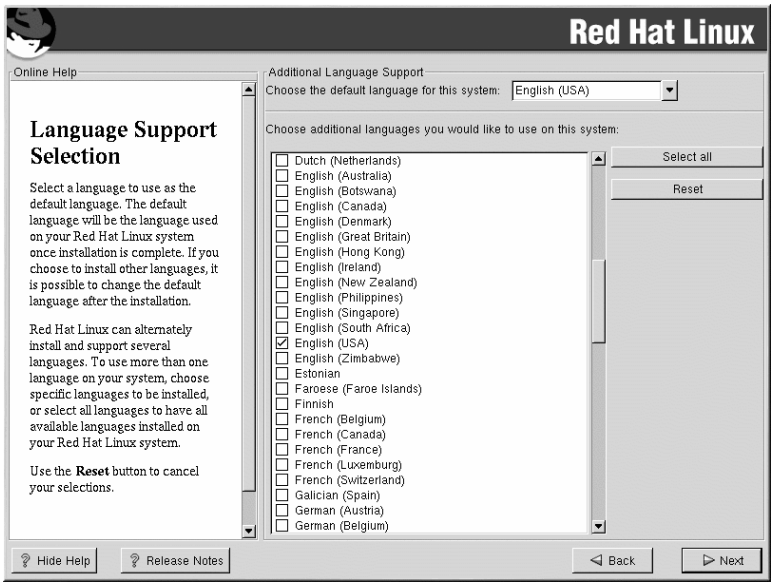
You can allow access to ports which are not listed here, by listing them in **Other ports** field. Use the following format: **`port:protocol`**. For example, if you want to allow IMAP access through your firewall, you can specify **`imap:tcp`**. You can also explicitly specify numeric ports; to allow UDP packets on port 1234 through the firewall, enter **`1234:udp`**. To specify multiple ports, separate them with commas.

3.14 Language Support Selection

Red Hat Linux can install and support multiple languages for use on your system.

You must select a language to use as the default language. The default language will be used on your Red Hat Linux system once installation is complete. If you choose to install other languages, you can change your default language after the installation.

Figure 3–11 Language Support Selection


Red Hat Linux
Online Help
Language Support Selection
Select a language to use as the default language. The default language will be the language used on your Red Hat Linux system once installation is complete. If you choose to install other languages, it is possible to change the default language after the installation.
Red Hat Linux can alternately install and support several languages. To use more than one language on your system, choose specific languages to be installed, or select all languages to have all available languages installed on your Red Hat Linux system.
Use the Reset button to cancel your selections.
Additional Language Support
Choose the default language for this system:
English (USA)
Choose additional languages you would like to use on this system:
Dutch (Netherlands)
English (Australia)
English (Botswana)
English (Canada)
English (Denmark)
English (Great Britain)
English (Hong Kong)
English (Ireland)
English (New Zealand)
English (Philippines)
English (Singapore)
English (South Africa)
English (USA)
English (Zimbabwe)
Estonian
Faroese (Faroe Islands)
Finnish
French (Belgium)
French (Canada)
French (France)
French (Luxemburg)
French (Switzerland)
Galician (Spain)
German (Austria)
German (Belgium)
Select all
Reset
Hide Help
Release Notes
Back
Next

If you are only going to use one language on your system, selecting only that language will save significant disk space. The default language is the language you selected to use during the installation. However, if you select only one language, you will only be able to use that specified language after the Red Hat Linux installation is complete.

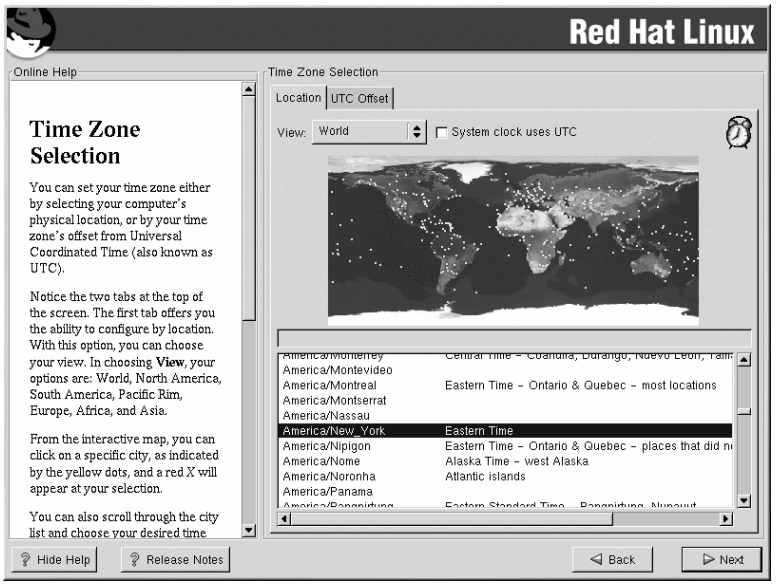
To use more than one language on your system, choose specific languages to be installed or select all languages to have all available languages installed on your Red Hat Linux system.

Use the **Reset** button to cancel your selections. Resetting will revert to the default; only the language you selected for use during the installation will be installed.

3.15 Time Zone Configuration

You can set your time zone by selecting your computer's physical location or by specifying your time zone's offset from Coordinated Universal Time (UTC).

Figure 3–12 Configuring the Time Zone


Red Hat Linux
Online Help
Time Zone Selection
You can set your time zone either by selecting your computer's physical location, or by your time zone's offset from Universal Coordinated Time (also known as UTC).
Notice the two tabs at the top of the screen. The first tab offers you the ability to configure by location. With this option, you can choose your view. In choosing View, your options are: World, North America, South America, Pacific Rim, Europe, Africa, and Asia.
From the interactive map, you can click on a specific city, as indicated by the yellow dots, and a red X will appear at your selection.
You can also scroll through the city list and choose your desired time
Time Zone Selection
Location
UTC Offset
View:
World
System clock uses UTC
America/Montevideo
America/Montreal
Eastern Time – Ontario & Quebec – most locations
America/Montserrat
America/Nassau
America/New_York
Eastern Time
America/Nipigon
Eastern Time – Ontario & Quebec – places that did n
America/Nome
Alaska Time – west Alaska
America/Noronha
Atlantic islands
America/Panama
Hide Help
Release Notes
Back
Next

Notice the two tabs at the top of the screen (see Figure 3–12, *Configuring the Time Zone*). The first tab allows you to configure your time zone by your location. You can specify different areas to view: **World**, **North America**, **South America**, **Pacific Rim**, **Europe**, **Africa**, and **Asia**.

On the interactive map, you can also click on a specific city, which is marked by a yellow dot; a red **X** will appear indicating your selection. You can also scroll through a list and choose a time zone.

The second tab allows you to specify a UTC offset. The tab displays a list of offsets to choose from, as well as an option to set daylight saving time.

On both tabs, you can select **System Clock uses UTC**. Please select this if you know that your system is set to UTC.

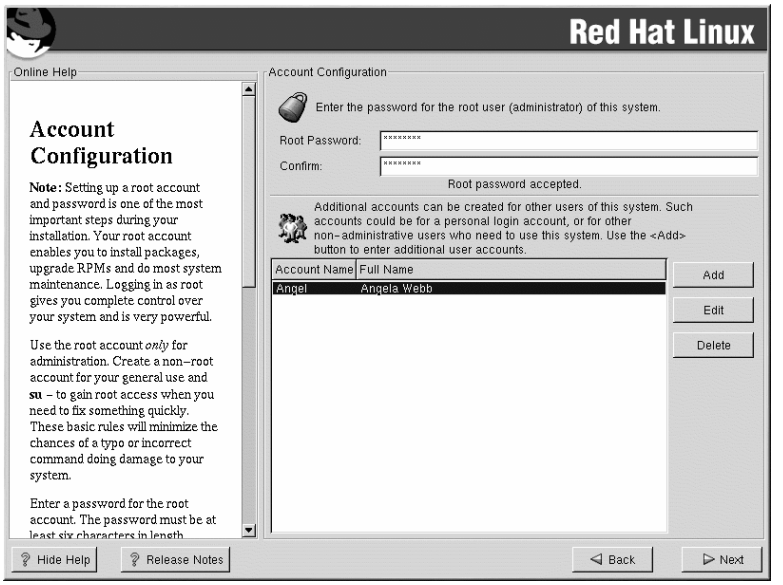
Tip

If you wish to change your time zone configuration after you have booted your Red Hat Linux system, become root and use the `/usr/sbin/time-config` command.

3.16 Account Configuration

The **Account Configuration** screen allows you to set your root password. Additionally, you can set up user accounts for you to log in to once the installation is complete (see Figure 3–13, *Account Creation*).

Figure 3–13 Account Creation


Red Hat Linux
Online Help
Account Configuration
Enter the password for the root user (administrator) of this system.
Root Password:
Confirm:
Root password accepted.
Additional accounts can be created for other users of this system. Such accounts could be for a personal login account, or for other non–administrative users who need to use this system. Use the <Add> button to enter additional user accounts.
Account Name
Full Name
Angel
Angela Webb
Add
Edit
Delete
Account Configuration
Note: Setting up a root account and password is one of the most important steps during your installation. Your root account enables you to install packages, upgrade RPMs and do most system maintenance. Logging in as root gives you complete control over your system and is very powerful.
Use the root account only for administration. Create a non–root account for your general use and su – to gain root access when you need to fix something quickly. These basic rules will minimize the chances of a typo or incorrect command doing damage to your system.
Enter a password for the root account. The password must be at
Hide Help
Release Notes
Back
Next

3.16.1 Setting the Root Password

Setting up a root account and password is one of the most important steps during your installation. Your root account is similar to the administrator account used on Windows NT machines. The root account is used to install packages, upgrade RPMs, and perform most system maintenance. Logging in as root gives you complete control over your system.

Use the root account only for system administration. Create a non-root account for your general use and `su -` to root when you need to fix something quickly. These basic rules will minimize the chances of a typo or an incorrect command doing damage to your system.

The installation program will prompt you to set a root password[2] for your system. You must enter a root password. The installation program will not let you proceed to the next section without entering a root password.

The root password must be at least six characters long; the password you type is not echoed to the screen. You must enter the password twice; if the two passwords do not match, the installation program will ask you to enter them again.

You should make the root password something you can remember, but not something that is easy for someone else to guess. Your name, your phone number, **qwerty**, **password, root**, **123456**, and **anteater** are all examples of bad passwords. Good passwords mix numerals with upper and lower case letters and do not contain dictionary words: **Aard387vark** or **420BMttNT**, for example. Remember that the password is case-sensitive. If you write down your password, keep it in a secure place. However, it is recommended that you do not write down this or any password you create.

Note

Do not use one of the example passwords offered in this manual. Using one of these passwords could be considered a security risk.

Note

The root user (also known as the superuser) has complete access to the entire system; for this reason, logging in as the root user is best done *only* to perform system maintenance or administration.

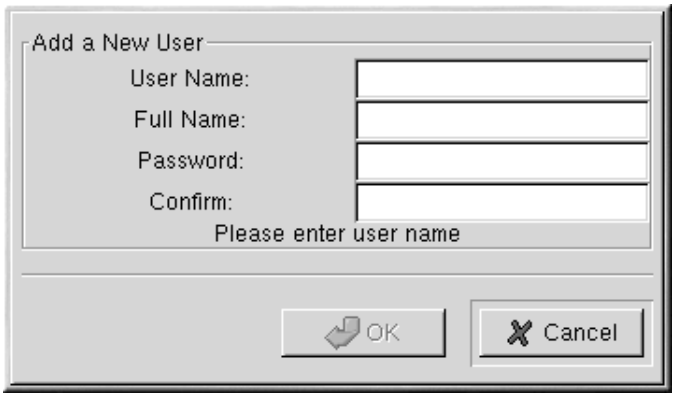
3.16.2 Setting Up User Accounts

If you choose to create a user account now, you will have an account to log in to once the installation has completed. This allows you to safely and easily log into your computer without having to be root to create your user account.

Enter an account name. Then enter and confirm a password for that user account. Enter the full name of the account user and press **Add**. Your account information will be added to the account list, and the user account fields will be cleared so that you can add another user.

[2] A root password is the administrative password for your Red Hat Linux system. You should only log in as root when needed for system maintenance. The root account does not operate within the restrictions placed on normal user accounts, so changes made as root can have implications for your entire system.

Figure 3–14 Creating a User Account



You can also choose **New** to add a new user. Enter the user's information and use the **Add** button to add the user to the account list.

You can also **Edit** or **Delete** the user accounts you have created and no longer want.

3.17 Authentication Configuration

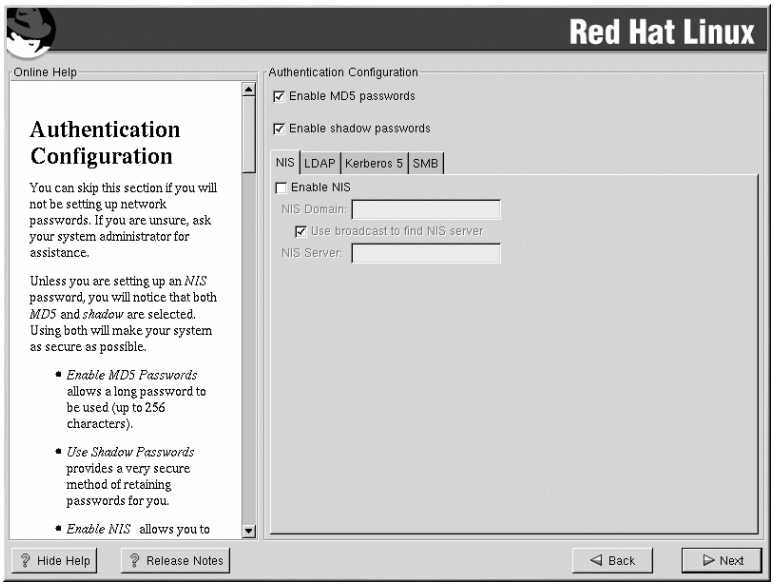
If you are performing a workstation or server installation, please skip ahead to Section 3.18, *Package Group Selection*.

You may skip this section if you will not be setting up network passwords. If you do not know whether you should do this, please ask your system administrator for assistance.

Unless you are setting up **NIS** authentication, you will notice that only **MD5** and **shadow** passwords are selected (see Figure 3–15, *Authentication Configuration*). We recommend you use both to make your machine as secure as possible.

To configure the NIS option, you must be connected to an NIS network. If you are not sure whether you are connected to an NIS network, please ask your system administrator.

Figure 3–15 Authentication Configuration


Red Hat Linux
Online Help
Authentication Configuration
You can skip this section if you will not be setting up network passwords. If you are unsure, ask your system administrator for assistance.
Unless you are setting up an NIS password, you will notice that both MD5 and shadow are selected. Using both will make your system as secure as possible.
Enable MD5 Passwords allows a long password to be used (up to 256 characters).
Use Shadow Passwords provides a very secure method of retaining passwords for you.
Enable NIS allows you to
Authentication Configuration
Enable MD5 passwords
Enable shadow passwords
NIS
LDAP
Kerberos 5
SMB
Enable NIS
NIS Domain:
Use broadcast to find NIS server
NIS Server:
Hide Help
Release Notes
Back
Next

- **Enable MD5 passwords** — allows a long password to be used (up to 256 characters), instead of the standard eight letters or less.
- **Enable shadow passwords** — provides a secure method for retaining passwords. The passwords are stored in `/etc/shadow`, which can only be read by root.
- **Enable NIS** — allows you to run a group of computers in the same Network Information Service domain with a common password and group file. You can choose from the following two options:
  - **NIS Domain** — allows you to specify the domain or group of computers your system belongs to.
  - **Use broadcast to find NIS server** — allows you to broadcast a message to your local area network to find an available NIS server.
  - **NIS Server** — causes your computer to use a specific NIS server, rather than broadcasting a message to the local area network asking for any available server to host your system.
- **Enable LDAP** — tells your computer to use LDAP for some or all authentication. LDAP consolidates certain types of information within your organization. For example, all of the different lists of users within your organization can be merged into one LDAP directory. For more information

about LDAP, refer to *Official Red Hat Linux Reference Guide, Lightweight Directory Access Protocol (LDAP)*. You can choose from the following options:

  – **LDAP Server** — allows you to access a specified server (by providing an IP address) running the LDAP protocol.

  – **LDAP Base DN** — allows you to look up user information by its Distinguished Name (DN).

  – **Use TLS** (*Transport Layer Security*) **lookups** — this option allows LDAP to send encrypted user names and passwords to an LDAP server before authentication.

- **Enable Kerberos** — Kerberos is a secure system for providing network authentication services. For more information about Kerberos, see *Using Kerberos 5 on Red Hat Linux* in the *Official Red Hat Linux Reference Guide*. There are three options to choose from here:

  – **Realm** — this option allows you to access a network that uses Kerberos, composed of one or a few servers (also known as KDCs) and a potentially large number of clients.

  – **KDC** — this option allows you access to the Key Distribution Center (KDC), a machine that issues Kerberos tickets (sometimes called a Ticket Granting Server or TGS).

  – **Admin Server** — this option allows you to access a server running kadmind.

- **Enable SMB Authentication** — Sets up PAM to use an SMB server to authenticate users. You must supply two pieces of information here:

  – **SMB Server** — Indicates which SMB server your workstation will connect to for authentication.

  – **SMB Workgroup** — Indicates which workgroup the configured SMB servers are in.

3.18 Package Group Selection

After your partitions have been selected and configured for formatting, you are ready to select packages for installation.

Note

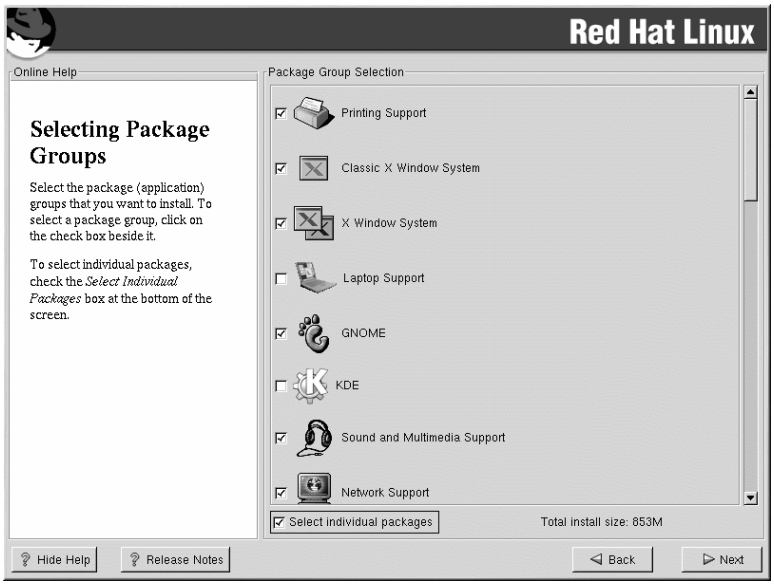
Unless you choose a custom installation, the installation program will automatically choose most packages for you. However, you must select either GNOME or KDE (or both) to install a graphical environment.

GNOME and KDE are both graphical desktop environments[3] that handle the overall look and feel of your system. You must choose one of these to have a default graphical setup, but you can also install both to determine for yourself which you prefer.

You can select components, which group packages together according to function (for example, **C Development**, **Networked Workstation**, or **Web Server**), individual packages, or a combination of the two.

To select a component, click on the checkbox beside it (see Figure 3–16, *Package Group Selection*).

Figure 3–16 Package Group Selection


Red Hat Linux
Online Help
Selecting Package Groups
Select the package (application) groups that you want to install. To select a package group, click on the check box beside it.
To select individual packages, check the Select Individual Packages box at the bottom of the screen.
Package Group Selection
Printing Support
Classic X Window System
X Window System
Laptop Support
GNOME
KDE
Sound and Multimedia Support
Network Support
Select individual packages
Total install size: 853M
Hide Help
Release Notes
Back
Next

Select each component you wish to install. Selecting **Everything** (at the end of the component list) during a custom installation installs all packages included with Red Hat Linux. If you select every package, you will need approximately 1.7 GB of free disk space.

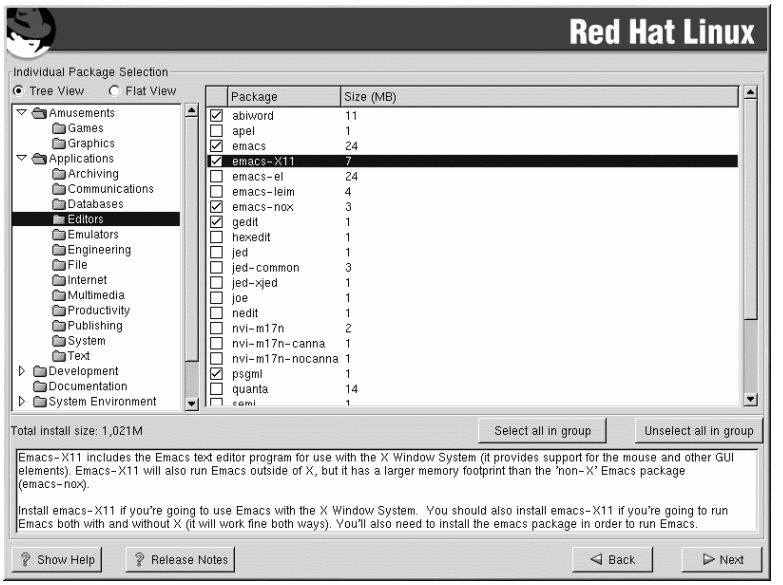
To select packages individually, check the **Select Individual Packages** box at the bottom of the screen.

[3] A desktop environment in Linux is similar to the environment you might see in other operating systems. However, environments differ in their look and feel and are easily customized for your individual needs.

3.18.1 Selecting Individual Packages

After selecting the components you wish to install, you can select or deselect individual packages. You can select or deselect packages using your mouse (see Figure 3–17, *Selecting Individual Packages*).

Figure 3–17 Selecting Individual Packages



You can choose to view the individual packages in **tree view** or **flat view**.

Tree view allows you to see the packages grouped by application type.

Flat view allows you to see all of the packages in an alphabetical listing on the right of the screen.

Using **Tree view**, you see a listing of package groups. When you expand this list and pick one group, the list of packages in that group appears in the panel on the right.

To sort alphabetically, click on the **Package** tab. To sort packages by size, click on the **Size (MB)** tab.

To select an individual package, double-click the checkbox beside the package name. A check mark in the box means that a package has been selected.

For more information about a specific package, click on the individual package name. The package information will appear at the bottom of the screen.

You can also select or deselect all packages listed within a particular group, by clicking on the **Select all in group** or **Unselect all in group** buttons.

Note

Some packages (such as the kernel and certain libraries) are required for every Red Hat Linux system and are not available to select or deselect. These base packages are selected by default.

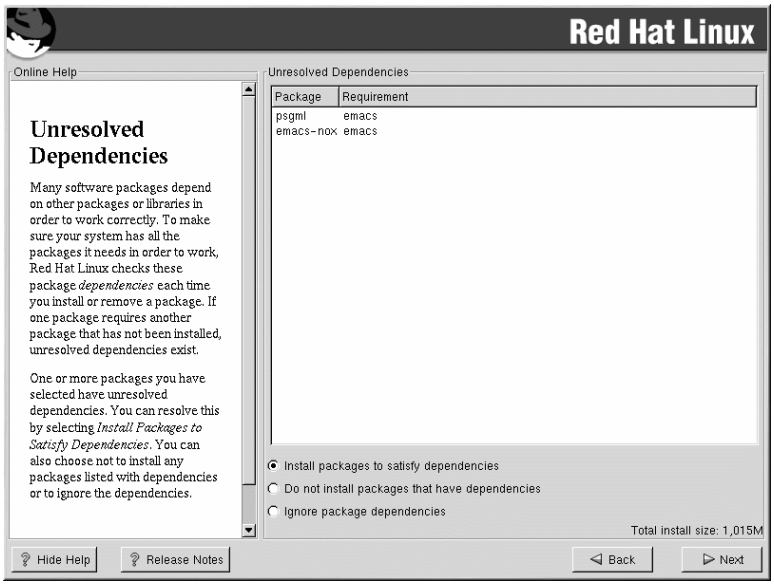
3.18.2 Unresolved Dependencies

Many software packages, in order to work correctly, depend on other software packages that must be installed on your system. For example, many of the graphical Red Hat system administration tools require the `python` and `pythonlib` packages. To make sure your system has all the packages it needs in order to be fully functional, Red Hat Linux checks these package **dependencies** each time you install or remove software packages.

If any package requires another package which you have not selected to install, the program presents a list of these unresolved dependencies and gives you the opportunity to resolve them (see Figure 3–18, *Unresolved Dependencies*).

The **Unresolved Dependencies** screen appears only if you are missing packages that are needed by the packages you have selected. At the bottom of the screen, under the list of missing packages, an **Install packages to satisfy dependencies** checkbox is selected by default. If you leave this checked, the installation program will resolve package dependencies automatically by adding all required packages to the list of selected packages.

Figure 3–18 Unresolved Dependencies


Red Hat Linux
Online Help
Unresolved Dependencies
Many software packages depend on other packages or libraries in order to work correctly. To make sure your system has all the packages it needs in order to work, Red Hat Linux checks these package dependencies each time you install or remove a package. If one package requires another package that has not been installed, unresolved dependencies exist.
One or more packages you have selected have unresolved dependencies. You can resolve this by selecting Install Packages to Satisfy Dependencies. You can also choose not to install any packages listed with dependencies or to ignore the dependencies.
Unresolved Dependencies
Package
Requirement
psgml emacs
emacs-nox emacs
Install packages to satisfy dependencies
Do not install packages that have dependencies
Ignore package dependencies
Total install size: 1,015M
Hide Help
Release Notes
Back
Next

3.19 X Configuration

The first part of X configuration deals with video card configuration.

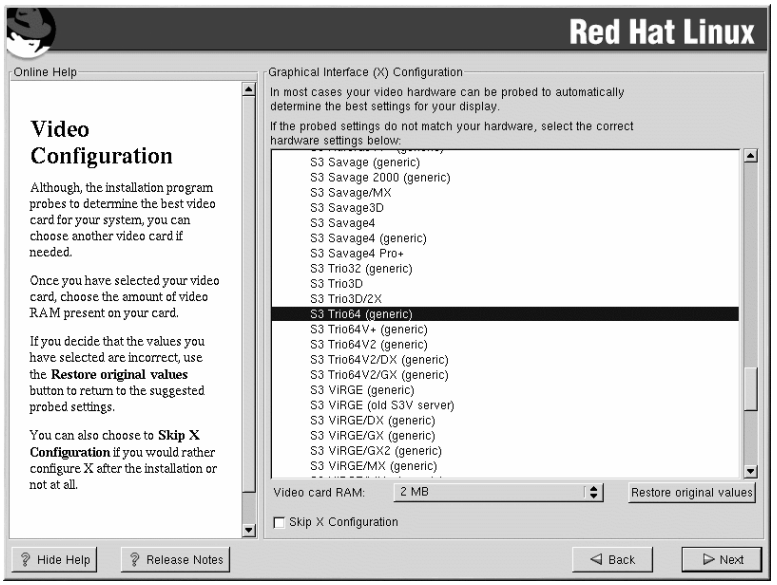
3.19.1 Video Card Configuration

Xconfigurator will now present a list of video cards for you to choose from.

If you decided to install the X Window System packages, you now have the opportunity to configure an X server for your system. If you did not choose to install the X Window System packages, skip ahead to Section 3.20, *Preparing to Install*.

If your video card does not appear on the list (see Figure 3–19, *Video Card Setup*), X may not support it. However, if you have technical knowledge about your card, you may choose **Unlisted Card** and attempt to configure it by matching your card's video chipset with one of the available X servers.

Figure 3–19 Video Card Setup


Red Hat Linux
Online Help
Video Configuration
Although, the installation program probes to determine the best video card for your system, you can choose another video card if needed.
Once you have selected your video card, choose the amount of video RAM present on your card.
If you decide that the values you have selected are incorrect, use the Restore original values button to return to the suggested probed settings.
You can also choose to Skip X Configuration if you would rather configure X after the installation or not at all.
Graphical Interface (X) Configuration
In most cases your video hardware can be probed to automatically determine the best settings for your display.
If the probed settings do not match your hardware, select the correct hardware settings below:
S3 Savage (generic)
S3 Savage 2000 (generic)
S3 Savage/MX
S3 Savage3D
S3 Savage4
S3 Savage4 (generic)
S3 Savage4 Pro+
S3 Trio32 (generic)
S3 Trio3D
S3 Trio3D/2X
S3 Trio64 (generic)
S3 Trio64V+ (generic)
S3 Trio64V2 (generic)
S3 Trio64V2/DX (generic)
S3 Trio64V2/GX (generic)
S3 ViRGE (generic)
S3 ViRGE (old S3V server)
S3 ViRGE/DX (generic)
S3 ViRGE/GX (generic)
S3 ViRGE/GX2 (generic)
S3 ViRGE/MX (generic)
Video card RAM:
2 MB
Restore original values
Skip X Configuration
Hide Help
Release Notes
Back
Next

Next, enter the amount of video memory installed on your video card. If you are not sure, please consult the documentation accompanying your video card. You will not damage your video card by choosing more memory than is available, but the X server may not start correctly if you do.

If you decide that the values you have selected are incorrect, you can click the **Restore original values** button to return to the suggested settings.

You can also select **Skip X Configuration** if you would rather configure X after the installation or not at all.

3.20 Preparing to Install

You should now see a screen preparing you for the installation of Red Hat Linux.

WARNING

If, for some reason, you would rather not continue with the installation process, this is your last opportunity to safely cancel the process and reboot your machine. Once you press the Next button, partitions will be written and packages will be installed. If you wish to abort the installation, you should reboot now before your hard drive(s) are rewritten.

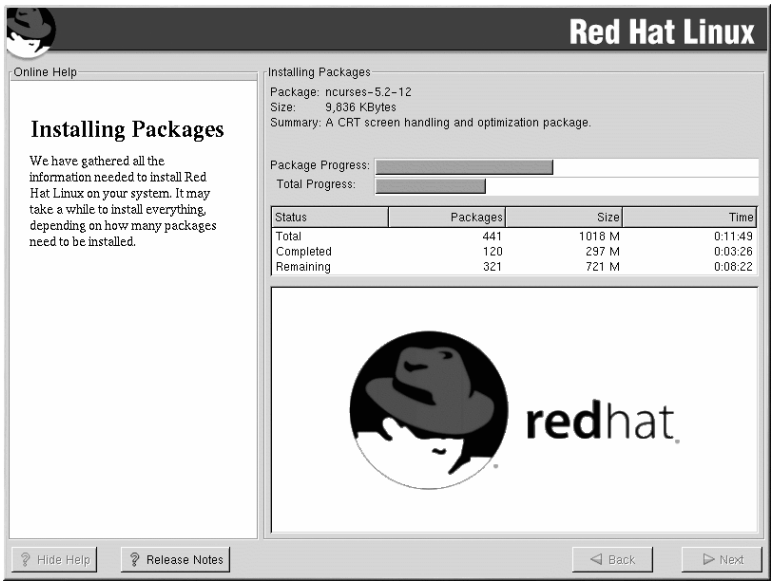
To cancel this installation process, press your computer's Reset button or use the [Control]-[Alt]-[Delete] key combination to restart your machine.

For your reference, a complete log of your installation can be found in `/tmp/install.log` once you reboot your system.

3.21 Installing Packages

At this point there is nothing left for you to do until all the packages have been installed (see Figure 3–20, *Installing Packages*). How quickly this happens depends on the number of packages you have selected and your computer's speed.

Figure 3–20 Installing Packages


Red Hat Linux
Online Help
Installing Packages
We have gathered all the information needed to install Red Hat Linux on your system. It may take a while to install everything, depending on how many packages need to be installed.
Installing Packages
Package: ncurses-5.2-12
Size: 9,836 KBytes
Summary: A CRT screen handling and optimization package.
Package Progress:
Total Progress:
Status Packages Size Time
Total 441 1018 M 0:11:49
Completed 120 297 M 0:03:26
Remaining 321 721 M 0:08:22
redhat
Hide Help
Release Notes
Back
Next

3.22 Boot Disk Creation

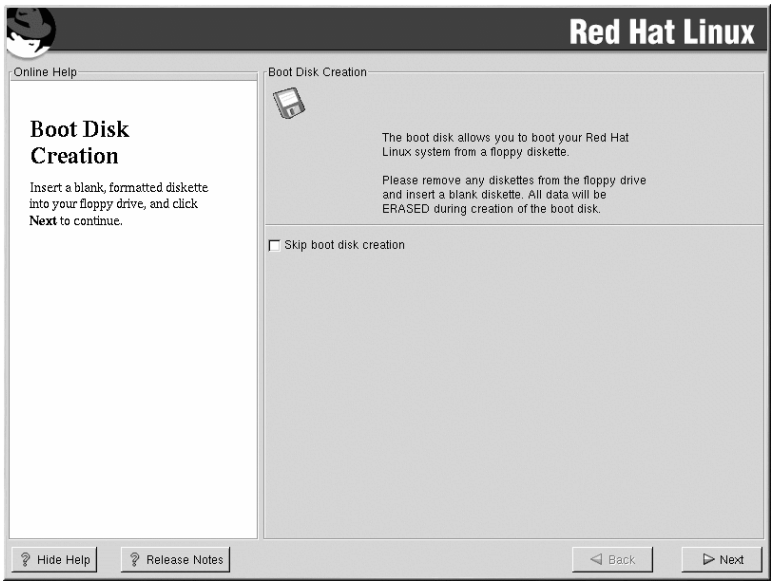
If you chose to create a boot disk, you should now insert a blank, formatted LS-120 diskette into your diskette drive (see Figure 3–21, *Creating Your Boot Disk*).

It is highly recommended that you create a boot disk.

After a short delay, your boot disk will be created; remove it from your diskette drive and label it clearly. Note that if you would like to create a boot disk after the installation, you will be able to do so. For more information, please see the `mkbootdisk` man page, by typing `man mkbootdisk` at the shell prompt.

If you boot your system with the boot disk, make sure you create a new boot disk if you make any changes to your kernel.

Figure 3–21 Creating Your Boot Disk


Red Hat Linux
Online Help
Boot Disk Creation
Insert a blank, formatted diskette into your floppy drive, and click Next to continue.
Boot Disk Creation
The boot disk allows you to boot your Red Hat Linux system from a floppy diskette.
Please remove any diskettes from the floppy drive and insert a blank diskette. All data will be ERASED during creation of the boot disk.
Skip boot disk creation
Hide Help
Release Notes
Back
Next

3.23 X Configuration

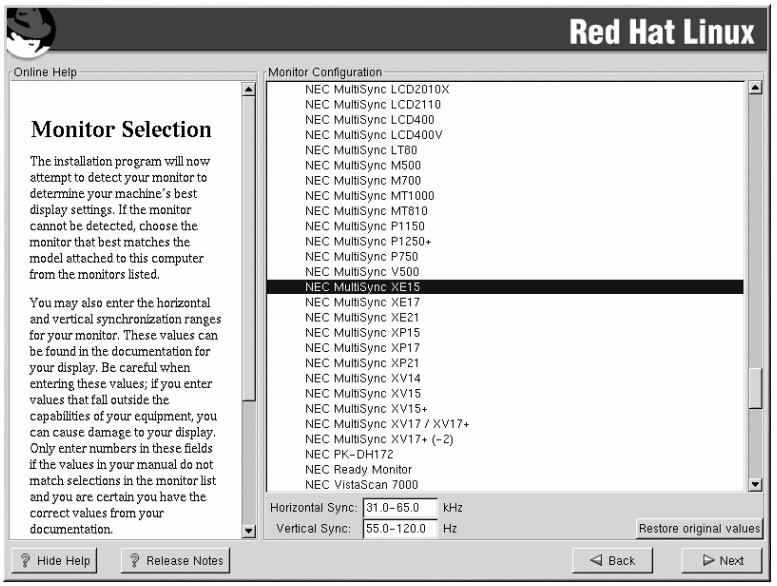
In order to complete X configuration, you must configure your monitor and customize your X settings.

3.23.1 Configuring Your Monitor

If you chose to skip X configuration, go to Section 3.24, *Installation Complete*.

Xconfigurator, the X Window System configuration tool, presents a list of monitors for you to choose from. In the list, you can either use the monitor that is autodetected for you, or choose another monitor.

Figure 3–22 Monitor Selection


Red Hat Linux
Online Help
Monitor Selection
The installation program will now attempt to detect your monitor to determine your machine's best display settings. If the monitor cannot be detected, choose the monitor that best matches the model attached to this computer from the monitors listed.
You may also enter the horizontal and vertical synchronization ranges for your monitor. These values can be found in the documentation for your display. Be careful when entering these values; if you enter values that fall outside the capabilities of your equipment, you can cause damage to your display. Only enter numbers in these fields if the values in your manual do not match selections in the monitor list and you are certain you have the correct values from your documentation.
Monitor Configuration
NEC MultiSync LCD2010X
NEC MultiSync LCD2110
NEC MultiSync LCD400
NEC MultiSync LCD400V
NEC MultiSync LT80
NEC MultiSync M500
NEC MultiSync M700
NEC MultiSync MT1000
NEC MultiSync MT810
NEC MultiSync P1150
NEC MultiSync P1250+
NEC MultiSync P750
NEC MultiSync V500
NEC MultiSync XE15
NEC MultiSync XE17
NEC MultiSync XE21
NEC MultiSync XP15
NEC MultiSync XP17
NEC MultiSync XP21
NEC MultiSync XV14
NEC MultiSync XV15
NEC MultiSync XV15+
NEC MultiSync XV17 / XV17+
NEC MultiSync XV17+ (-2)
NEC PK-DH172
NEC Ready Monitor
NEC VistaScan 7000
Horizontal Sync: 31.0-65.0 kHz
Vertical Sync: 55.0-120.0 Hz
Restore original values
Hide Help
Release Notes
Back
Next

If your monitor does not appear on the list, select the most appropriate **Generic** model available. If you do select a **Generic** monitor, Xconfigurator will suggest horizontal and vertical sync ranges. These values are generally available in the documentation which accompanies your monitor, or from your monitor's vendor or manufacturer; please check your documentation to make sure these values are set correctly.

CAUTION

Do not select a monitor *similar* to your monitor unless you are certain that the monitor you are selecting does not exceed the capabilities of your monitor. Doing so may overclock your monitor and damage or destroy it.

The horizontal and vertical ranges that Xconfigurator suggests for your monitor are also displayed on this screen.

If you decide that the values you have selected are incorrect, you can click the **Restore original values** button to return to the suggested settings.

Click **Next** when you have finished configuring your monitor.

3.23.2 Custom Configuration

Choose the correct color depth and resolution for your X configuration. Click **Test Setting** to try out this configuration. If you do not like what you see during the test, click **No** to choose another resolution.

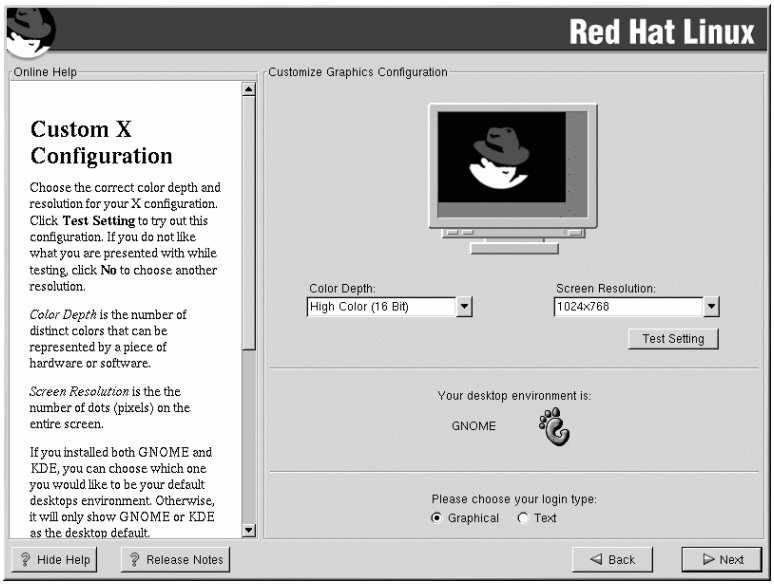
Note

If you need to exit out of the X test, use the [Ctrl]-[Alt]-[Backspace] key combination. Also note that this will not work in some test cases.

We recommend that you test your configuration, to make sure the resolution and color settings are usable.

If you installed both GNOME and KDE, you can choose which one to use as your default desktop environment. If you installed one or the other, it will only show GNOME or KDE as the desktop default.

Figure 3–23 X Customization


Red Hat Linux
Online Help
Custom X Configuration
Choose the correct color depth and resolution for your X configuration. Click Test Setting to try out this configuration. If you do not like what you are presented with while testing, click No to choose another resolution.
Color Depth is the number of distinct colors that can be represented by a piece of hardware or software.
Screen Resolution is the the number of dots (pixels) on the entire screen.
If you installed both GNOME and KDE, you can choose which one you would like to be your default desktops environment. Otherwise, it will only show GNOME or KDE as the desktop default.
Customize Graphics Configuration
Color Depth:
High Color (16 Bit)
Screen Resolution:
1024x768
Test Setting
Your desktop environment is:
GNOME
Please choose your login type:
Graphical
Text
Hide Help
Release Notes
Back
Next

You can also choose whether you want to boot your system into a text or graphical environment once Red Hat Linux is installed. Unless you have special needs, booting into a graphical environment (similar to a Windows environment) is recommended. If you choose to boot into a text environment, you will be presented with a command prompt (similar to a DOS environment).

3.24 Installation Complete

Congratulations! Your Red Hat Linux 7.2 installation is now complete!

The installation program will prompt you to prepare your system for reboot. Do not forget to remove any diskette in the diskette drive or CD in the CD-ROM drive.

3.25 Booting Your Machine and Post-Installation Setup

This section describes how to boot your Itanium into Red Hat Linux and how to set your EFI console variables so that Red Hat Linux is automatically booted when the machine is powered on.

After you reboot your system at the end of the installation program, type the following command to boot into Red Hat Linux:

```
Shell>elilo
```

After you type `elilo`, the default kernel listed in the `/boot/efi/elilo.conf` configuration file is loaded. (The first kernel listed in the file is the default.)

If you want to load a different kernel, type the label name of the kernel from the file `/boot/efi/elilo.conf`. after `elilo`. For example, to load the kernel named `linux-up` for the uni-processor kernel, type

```
Shell>elilo linux-up
```

If you do not know the names of the installed kernels, you can view the `/boot/efi/elilo.conf` file in EFI with the following instructions:

1. At the `Shell>` prompt, change devices to the system partition (mounted as `/boot/efi` in Linux). For example, if `fs0` is the system boot partition, type **`fs0:`** at the EFI Shell prompt.
2. Type `ls` at the `fs0:\>` to make sure you are in the correct partition.
3. Then type

```
Shell>type elilo.conf
```

This command displays the contents of the configuration file. Each stanza contains a line beginning with `label` followed by a label name for that kernel. The label name is what you type after `elilo` to boot the different kernels.

3.25.1 Post-Installation Boot Loader Options

In addition to specifying a kernel to load, you can also enter other boot options such as **`single`** for single user mode or **`mem=1024M`** to force Red Hat Linux to see 1024 MB of memory. To pass options to the boot loader, enter the following at the EFI Shell prompt (replace ***`linux`*** with the label name of the kernel you want to boot and ***`option`*** with the boot options you want to pass to the kernel):

```
Shell>elilo linux option
```

3.25.2 Booting Red Hat Linux Automatically

After installing Red Hat Linux you can type **`elilo`** and any boot options at the EFI Shell prompt each time you wish to boot your Itanium system. However, if you wish to configure your system to boot into Red Hat Linux automatically, you need to configure the EFI Boot Manager.

To configure the EFI Boot Manager (may vary slighly depending on your hardware):

1. Boot the Itanium system and choose **Boot option maintenance menu** from the EFI Boot Manager menu.
2. Choose **Add a Boot Option** from the Main Menu.
3. Select the system partition that is mounted as `/boot/efi` in Linux.
4. Select the `elilo.efi` file.
5. At the `Enter New Description:` prompt, type **`Red Hat Linux 7.2`**, or any name that you want to appear on the EFI Boot Manager menu.
6. At the `Enter Boot Option Data Type` prompt, enter **`N`** for **No Boot Option** if you do not want to pass options to the ELILO boot loader. This option will work for most cases. If you want to pass options to the boot loader, you can configure it in the `/boot/efi/elilo.conf` configuration file instead.
7. Answer **`Yes`** to the `Save changes to NVRAM` prompt. This will return you to the EFI Boot Maintenance Manager menu.
8. Next, you want to make the **Red Hat Linux 7.2** menu item the default. You will see a list of boot options. Move the **Red Hat Linux 7.2** menu item up to the top of the list by selecting it with the arrow keys and pressing the [u] key to move it up the list. You can move items down the list

by selecting it and pressing the [d] key. After changing the boot order, choose **Save changes to NVRAM**. Choose **Exit** to return to the Main Menu.

9. Optionally, you can change to boot timeout value by choosing **Set Auto Boot TimeOut** => **Set Timeout Value** from the Main Menu.

10. Return to the EFI Boot Manager by selecting **Exit**.

Using a Startup Script

It is recommended that you configure the ELILO Boot Manager to boot Red Hat Linux automatically. However, if you require additional commands to be executed before starting the ELILO boot loader, you can create a startup script named `startup.nsh`. The last command should be `elilo` to boot into Linux.

The `startup.nsh` script should be in the `/boot/efi` partition (`/boot/efi/startup.nsh`) and contain the following text:

```
echo -off
your set of commands
elilo
```

If you want to pass options to the boot loader (see Section 3.25.1, *Post-Installation Boot Loader Options*) add them after **`elilo`**.

You can either create this file after booting into Red Hat Linux or use the editor built into the EFI shell. To use the EFI shell, at the `Shell>` prompt, change devices to the system partition (mounted as `/boot/efi` in Linux). For example, if `fs0` is the system boot partition, type `fs0:` at the EFI Shell prompt. Type `ls` to make sure you are in the correct partition. Then type `edit startup.nsh`. Type the contents of the file and save it.

The next time the system boots, EFI will detect the `startup.nsh` file and use it to boot the system. To stop EFI from loading the file, type [Ctrl]-[c]. This will abort the process, and you will return to the EFI shell prompt.

4 Installing Red Hat Linux via Text Mode

This release of Red Hat Linux features a graphical, mouse-based installation program, but you can also install Red Hat Linux using a text mode, keyboard-based installation program. This chapter briefly explains how to use the text mode installation program. Here are some recommendations:

- If you are new to Linux installations, read Chapter 3, *Installing Red Hat Linux* first. The main focus of the chapter is the graphical installation process, but most of the concepts apply to the text mode installation as well. After reading that chapter, Section 4.1, *Things You Should Know* will give you more information regarding the aspects of installing Red Hat Linux that do not apply to the graphical installation process.

  Additionally, Appendix E, *An Introduction to Disk Partitions* may be helpful to you, since it discusses disk partition resizing. If you plan to install Red Hat Linux on a disk where another operating system is currently installed, this knowledge will be crucial.

- If you plan to install over a network (via NFS, FTP, or HTTP), you must make a network boot disk. *Booting the Installation Program from an LS-120 Diskette* in Section 2.2.3 explains how to do this.

- If you have never used the text mode installation program, or need a refresher on its user interface, read the next sections.

- To begin installation without further delay, turn to Section 4.3, *Starting the Installation Program*.

4.1 Things You Should Know

Before attempting to install Red Hat Linux, you should collect information about your system. This information will help prevent any surprises during the installation. You can find most of this information in the documentation that came with your system, or from the system's vendor or manufacturer.

The most recent list of supported hardware can be found at http://hardware.redhat.com. You should check your hardware against this list before proceeding.

Note

You can perform a text mode installation of Red Hat Linux 7.2 by following the instructions in this chapter. However, if you are installing from a CD-ROM, you might prefer to use the graphical installation mode, which is easy to use and provides a flexible, custom installation mode. For more information on graphical installations, turn to Chapter 3, *Installing Red Hat Linux*.

4.1.1 Basic Hardware Configuration

You should have a basic understanding of the hardware installed in your computer, including the following:

- Hard drive(s) — specifically, the number, size, and type. If you have more than one, it is helpful to know which one is first, second, and so on. It is also good to know if your drives are IDE or SCSI. If you have IDE drives, you should check your computer's BIOS to see if you are accessing them in linear mode. Please refer to your computer's documentation for the proper key sequence to access the BIOS. Note that your computer's BIOS may refer to linear mode by other names, such as "large disk mode." Again, your computer's documentation should be consulted for clarification.
- Memory — the amount of RAM installed in your computer.
- CD-ROM — most importantly, the unit's interface type (IDE, SCSI, or other interface) and, for non-IDE, non-SCSI CD-ROMs, the make and model number. IDE CD-ROMs (also known as AT-API) are the most common type of CD-ROM in recently manufactured, PC-compatible computers.
- SCSI adapter (if one is present) — the adapter's make and model number.
- Network card (if one is present) — the card's make and model number.
- Mouse — the mouse's type (serial, PS/2, or bus mouse), protocol (Microsoft, Logitech, MouseMan, etc.), and number of buttons; also, for serial mice, the serial port it is connected to.

On many newer systems, the installation program is able to automatically identify most hardware. However, it is a good idea to collect this information anyway, just to be sure.

4.1.2 Video Configuration

If you will be installing the X Window System, you should also be familiar with the following:

- Your video card — the card's make and model number (or the video chipset it uses) and the amount of video RAM it has. (Most PCI-based cards are auto-detected by the installation program.)
- Your monitor — the unit's make and model number, along with allowable ranges for horizontal and vertical refresh rates. (Newer models may be auto-detected by the installation program.)

4.1.3 Network-related Information

If you are connected to a network, be sure you know the following:

- IP address — usually represented as a set of four numbers separated by dots, such as `10.0.2.15`.
- Netmask — another set of four numbers separated by dots; an example netmask would be `255.255.248.0`.

- Gateway IP address — another set of four dot-separated numbers; for example, `10.0.2.254`.
- One or more name server IP addresses — one or more sets of dot-separated numbers; for example, `10.0.2.1` might be the address of a name server.
- Domain name — the name your organization uses; for example, Red Hat has a domain name of `redhat.com`.
- Hostname — the name assigned to your individual system; for example, a computer might be named `pooh`.

Note

The information provided here is as an example only! Do *not* use it when you install Red Hat Linux! If you do not know the proper values for your network, ask your network administrator.

4.2 The Installation Program User Interface

The Red Hat Linux text mode installation program uses a screen-based interface that includes most of the on-screen "widgets" commonly found on graphical user interfaces. Figure 4–1, *Installation Program Widgets as seen in* **Configure TCP/IP** and Figure 4–2, *Installation Program Widgets as seen in Disk Druid* illustrate the screens you will see.

Figure 4–1 Installation Program Widgets as seen in Configure TCP/IP

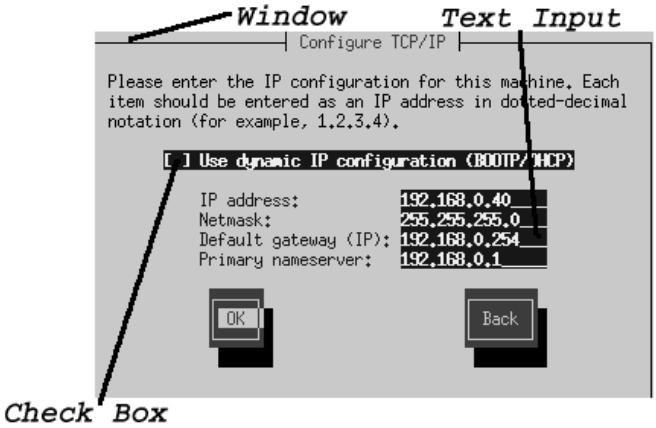
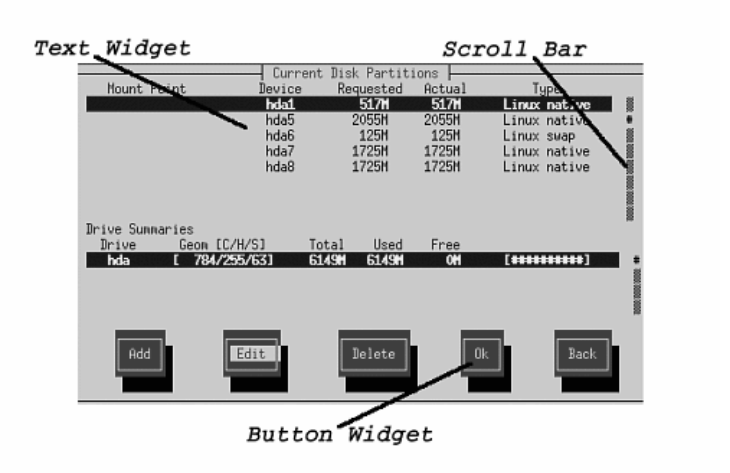

Window
Text Input
Configure TCP/IP
Please enter the IP configuration for this machine. Each item should be entered as an IP address in dotted-decimal notation (for example, 1.2.3.4).
[ ] Use dynamic IP configuration (BOOTP/DHCP)
IP address: 192.168.0.40
Netmask: 255.255.255.0
Default gateway (IP): 192.168.0.254
Primary nameserver: 192.168.0.1
OK
Back
Check Box

Figure 4–2 Installation Program Widgets as seen in Disk Druid



Here is a list of the most important widgets shown in Figure 4–1, *Installation Program Widgets as seen in* **Configure TCP/IP** and Figure 4–2, *Installation Program Widgets as seen in Disk Druid* :

- Window — windows (usually referred to as **dialogs** in this manual) will appear on your screen throughout the installation process. At times, one window may overlay another; in these cases, you can only interact with the window on top. When you are finished in that window, it will disappear, allowing you to continue working in the window underneath.
- Text Input — text input lines are regions where you can enter information required by the installation program. When the cursor rests on a text input line, you may enter and/or edit information on that line.
- Checkbox — checkboxes allow you to select or deselect a feature. The box displays either an asterisk (selected) or a space (unselected). When the cursor is within a checkbox, press [Space] to select an unselected feature or to deselect a selected feature.
- Text widget — text widgets are regions of the screen for the display of text. At times, text widgets may also contain other widgets, such as checkboxes. If a text widget contains more information than can be displayed in the space reserved for it, a scroll bar appears; if you position the cursor within the text widget, you can then use the [Up] and [Down] arrow keys to scroll through all the information available. Your current position is shown on the scroll bar by a # character, which moves up and down the scroll bar as you scroll.

- Button widget — button widgets are the primary method of interacting with the installation program. You progress through the windows of the installation program by navigating these buttons, using the [Tab] and [Enter] keys. Buttons can be selected when they are highlighted.
- Cursor — although not a widget, the cursor is used to select (and interact) with a particular widget. As the cursor is moved from widget to widget, it may cause the widget to change color, or you may only see the cursor itself positioned in or next to the widget. In Figure 4–1, *Installation Program Widgets as seen in* **Configure TCP/IP**, the cursor is positioned on the **OK** button. Figure 4–2, *Installation Program Widgets as seen in Disk Druid* shows the cursor on the **Edit** button.

4.2.1 Using the Keyboard to Navigate

Navigation through the installation dialogs is performed through a simple set of keystrokes. To move the cursor, use [Left], [Right], [Up], and [Down] arrow keys. Use [Tab], and [Alt]-[Tab] to cycle forward or backward through each widget on the screen. Along the bottom, most screens display a summary of available cursor positioning keys.

To "press" a button, position the cursor over the button (using [Tab], for example) and press [Space] or [Enter]. To select an item from a list of items, move the cursor to the item you wish to select and press [Enter]. To select an item with a checkbox, move the cursor to the checkbox and press [Space] to select an item. To deselect, press [Space] a second time.

Pressing [F12] accepts the current values and proceeds to the next dialog; it is equivalent to pressing the **OK** button.

Unless a dialog box is waiting for your input, do not press any keys during the installation process (doing so may result in unpredictable behavior).

4.3 Starting the Installation Program

The following methods can be used to start the installation:

- Insert a boot diskette that you have created into the primary diskette drive and reboot your computer.
- Insert the Red Hat Linux CD 1 into the drive and reboot, if your computer can boot from the CD-ROM drive.

Refer to Section 2.2.3, *Booting the Installation Program* to determine whether you can boot off the CD-ROM or need to boot off a boot diskette.

To boot into text mode, at the EFI Shell type:

```
Shell>elilo linux text
```

4.3.1 Displaying Online Help

Once the installation program is loaded into memory, you can obtain information about the installation process and options by pressing [F1] through [F6]. For example, press [F2] to see general information about the online help screens.

4.4 Installation Cross-reference Table

Most text mode installation screens can be cross-referenced with their GUI screen counterparts. This table lists the installation screens in order and where you can go to get the necessary information for each part of the installation.

For those screens which do not have adequate GUI counterparts, installation-related instructions and screenshots will be provided in this chapter.

Table 4–1 Installation Cross-reference Table

Text Mode Screen	Text Mode Reference Point
Language Screen	Section 3.3, *Language Selection*
Keyboard Screen	Section 3.4, *Keyboard Configuration* — Layout
Installation Method	Section 3.2, *Selecting an Installation Method*
Identify Disk Partition to Install From	Section 4.5, *Identify Disk Partition to Install From*
Installing over a Network	Section 4.6, *Installing over a Network*
Mouse Selection	Section 3.5, *Mouse Configuration*
Welcome Screen	Section 3.6, *Welcome to Red Hat Linux*
Installation Type	Section 3.7, *Install Options*
Disk Partitioning Setup	Section 3.8, *Disk Partitioning Setup*
Automatic Partitioning	Section 3.9, *Automatic Partitioning*
Disk Druid	Section 3.10, *Partitioning Your System*
fdisk	Section 3.11, *Partitioning with fdisk*
Hostname Configuration	Section 3.12, *Network Configuration*

Text Mode Screen	Text Mode Reference Point
Firewall Configuration	Section 3.13, *Firewall Configuration*
Network Configuration	Section 3.12, *Network Configuration*
Language Support and Default Language	Section 3.14, *Language Support Selection*
Time Zone Selection	Section 3.15, *Time Zone Configuration*
Root Password	Section 3.16, *Account Configuration*
Add User/User Account Setup	Section 3.16, *Account Configuration*
Authentication Configuration	Section 3.17, *Authentication Configuration*
Package Installation (Group, Individual, Dependencies)	Section 3.18, *Package Group Selection*
Video Card Configuration	Section 3.23, *X Configuration*
Package Installation	Section 3.20, *Preparing to Install* and Section 3.21, *Installing Packages*
Monitor Configuration	Section 3.23.1, *Configuring Your Monitor*
Custom X Configuration	Section 3.23.2, *Custom Configuration*
Installation Complete	Section 3.24, *Installation Complete*

4.5 Identify Disk Partition to Install From

Note

Hard drive installations only work from ext2, ext3, or FAT filesystems. If you have a filesystem other than those listed here, such as reiserfs, you will not be able to perform a hard drive installation.

Hard drive installations require the use of the ISO (or CD-ROM) images rather than copying an entire installation tree. After placing the required ISO images (the binary Red Hat Linux CD-ROMs) in a directory, choose to install from the hard drive. You will then point the installation program at that directory to perform the installation.

Verifying that the ISO images are intact before you attempt an installation, will help to avoid problems that are often encountered during a hard drive installation. To verify the ISO images are intact prior

to performing an installation, use an md5sum program (many md5sum programs are available for various operating systems). An md5sum program should be available on the same server as the ISO images.

The **Select Partition** screen (Figure 4–3, *Selecting Partition Dialog for Hard Drive Installation*) applies only if you are installing from a disk partition (that is, if you selected **Hard Drive** in the **Installation Method** dialog). This dialog allows you to name the disk partition and directory from which you are installing Red Hat Linux.

Enter the device name of the partition containing the Red Hat ISO images. There is also a field labeled **Directory holding images**. If the ISO images are not in the root directory of that partition, enter the path to the ISO images (for example, if the ISO images are in `/test/new/RedHat`, you would enter `/test/new`).

After you have identified the disk partition, you will next see the **Welcome** dialog. See Table 4–1, *Installation Cross-reference Table* for more information.

Figure 4–3 Selecting Partition Dialog for Hard Drive Installation

Welcome to Red Hat Linux
Select Partition
What partition and directory on that partition hold the CD (iso9660) images for Red Hat Linux? If you don't see the disk drive you're using listed here, press F2 to configure additional devices.
/dev/hda1
/dev/hda5
Directory holding images: /test/new
OK
Back
<Tab>/<Alt-Tab> between elements | <Space> selects | <F12> next screen

4.6 Installing over a Network

If you are performing a network installation, the **Configure TCP/IP** dialog appears; for an explanation of this dialog, go to Section 3.12, *Network Configuration* and then return here.

4.6.1 Setting Up the Server

Because the Red Hat Linux 7.2 installation program is capable of installing Red Hat Linux from multiple CD-ROMs, if you intend to support NFS, FTP, or HTTP installations you must copy the `RedHat` directory from each CD-ROM comprising Red Hat Linux 7.2 onto a disk drive:

- Insert CD-ROM 1 and execute the following commands:
  - `mount /mnt/cdrom`
  - `cp -var /mnt/cdrom/RedHat /location/of/disk/space`

    Where */location/of/disk/space* is a directory you create such as */export/7.2/*.
  - `umount /mnt/cdrom`

- Insert CD-ROM 2 and execute the following commands:
  - `mount /mnt/cdrom`
  - `cp -var /mnt/cdrom/RedHat /location/of/disk/space`

    Where */location/of/disk/space* is a directory you create such as */export/7.2/*.
  - `umount /mnt/cdrom`

- Next, make */location/of/disk/space* accessible to the installation program (for example, exporting it for NFS installations).

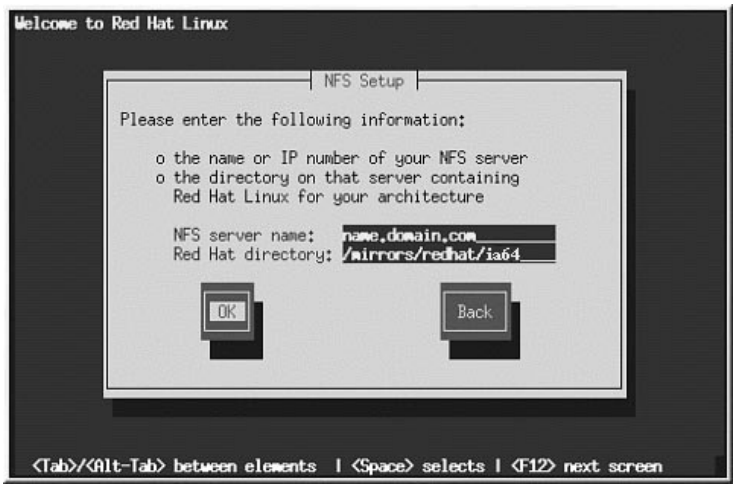
  ```
  Export /location/of/disk/space
  ```

  If you are not sure how to do this, refer to the *Official Red Hat Linux Customization Guide* and the *Official Red Hat Linux Reference Guide* for more information.

4.6.2 NFS Setup

The NFS dialog (Figure 4–4, *NFS Setup Dialog*) applies only if you are installing from an NFS server (if you selected **NFS Image** in the **Installation Method** dialog).

Figure 4–4 NFS Setup Dialog


Welcome to Red Hat Linux
NFS Setup
Please enter the following information:
o the name or IP number of your NFS server
o the directory on that server containing
Red Hat Linux for your architecture
NFS server name: name.domain.com
Red Hat directory: /mirrors/redhat/ia64
OK
Back
<Tab>/<Alt-Tab> between elements | <Space> selects | <F12> next screen

Enter the fully-qualified domain name or IP address of your NFS server. For example, if you are installing from a host named `eastcoast` in the domain `redhat.com`, enter `eastcoast.redhat.com` in the **NFS Server** field.

Next, enter the name of the exported directory. If you followed the setup described in Section 4.6, *Installing over a Network*, you would enter the directory */location/of/disk/space/* which contains the `RedHat` directory.

If the NFS server is exporting a mirror of the Red Hat Linux installation tree, enter the directory which contains the `RedHat` directory. (If you do not know this directory path, ask your system administrator.) For example, if your NFS server contains the directory `/mirrors/redhat/ia64/RedHat`, enter `/mirrors/redhat/ia64`.

Next you will see the **Welcome** dialog. See Table 4–1, *Installation Cross-reference Table* for more information.

4.6.3 FTP Setup

The FTP dialog (Figure 4–5, *FTP Setup Dialog*) applies only if you are installing from an FTP server (if you selected **FTP** in the **Installation Method** dialog). This dialog allows you to identify the FTP server from which you are installing Red Hat Linux.

Figure 4–5 FTP Setup Dialog

Welcome to Red Hat Linux
FTP Setup
Please enter the following information:
o the name or IP number of your FTP server
o the directory on that server containing
Red Hat Linux for your architecure
FTP site name: updates.redhat.com
Red Hat directory: pub/mirrors/redhat/ia64
[ ] Use non-anonymous ftp
OK
Back
<Tab>/<Alt-Tab> between elements | <Space> selects | <F12> next screen

Enter the name or IP address of the FTP site you are installing from, and the name of the directory containing the `RedHat` installation files for your architecture. For example, if the FTP site contains the directory `/mirrors/redhat/ia64/RedHat`, enter `/mirrors/redhat/ia64`.

If everything has been specified properly, a message box appears indicating that `base/hdlist` is being retrieved.

Next you will see the **Welcome** dialog. See Table 4–1, *Installation Cross-reference Table* for more information.

4.6.4 HTTP Setup

The HTTP dialog (Figure 4–6, *HTTP Setup Dialog*) applies only if you are installing from an HTTP server (if you selected **HTTP** in the **Installation Method** dialog). This dialog prompts you for information about the HTTP server from which you are installing Red Hat Linux.

Figure 4–6 HTTP Setup Dialog

Welcome to Red Hat Linux
HTTP Setup
Please enter the following information:
o the name or IP number of your web server
o the directory on that server containing
Red Hat Linux for your architecure
Web site name: www.redhat.com
Red Hat directory: pub/mirrors/redhat/ia64
OK
Back
<Tab>/<Alt-Tab> between elements | <Space> selects | <F12> next screen

Enter the name or IP address of the HTTP site you are installing from, and the name of the directory there containing the `RedHat` installation files for your architecture. For example, if the HTTP site contains the directory `/mirrors/redhat/ia64/RedHat`, enter `/mirrors/redhat/ia64`.

If everything has been specified properly, a message box appears indicating that `base/hdlist` is being retrieved.

Next you will see the **Welcome** dialog. See Table 4–1, *Installation Cross-reference Table* for more information.

A Upgrading Your Current System

This appendix walks you through a typical Red Hat Linux 7.2 upgrade.

A.1 What it Means to Upgrade

The installation process for Red Hat Linux 7.2 includes the ability to upgrade from prior versions of Red Hat Linux (version 3.0.3 and later) which are based on RPM technology.

Upgrading your system installs the modular 2.4.*x* kernel as well as updated versions of the packages which are currently installed on your system.

The upgrade process preserves existing configuration files by renaming them with an `.rpmsave` extension (for example, `sendmail.cf.rpmsave`). The upgrade process also creates a log of its actions in `/tmp/upgrade.log`. As software evolves, configuration file formats can change, so you should carefully compare your original configuration files to the new files before integrating your changes.

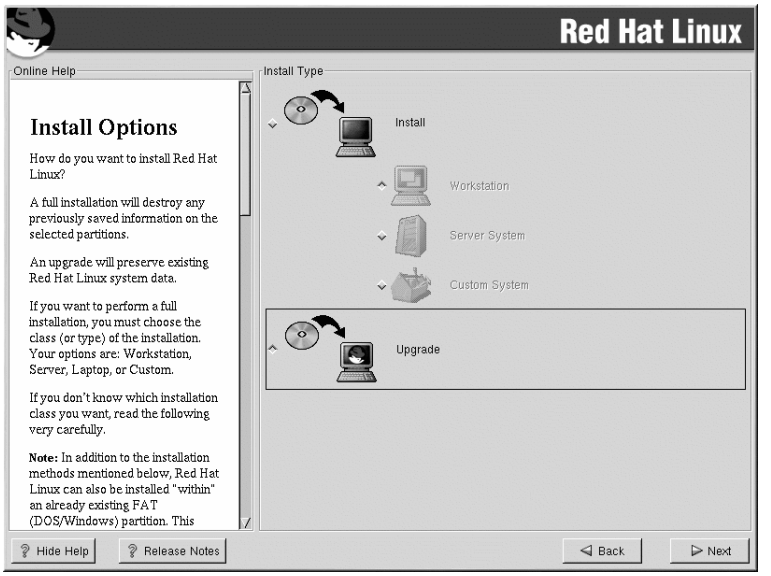
Note

Some upgraded packages may require the installation of other packages for proper operation. If you choose to customize your packages to upgrade, you may be required to resolve dependency problems. Otherwise, the upgrade procedure takes care of these dependencies, but it may need to install additional packages which are not on your system.

A.2 Upgrading Your System

At this point, you should have chosen **Upgrade** as your preferred installation type (see Figure A–1, *Choosing Install or Upgrade*).

Figure A–1 Choosing Install or Upgrade


Red Hat Linux
Online Help
Install Options
How do you want to install Red Hat Linux?
A full installation will destroy any previously saved information on the selected partitions.
An upgrade will preserve existing Red Hat Linux system data.
If you want to perform a full installation, you must choose the class (or type) of the installation. Your options are: Workstation, Server, Laptop, or Custom.
If you don't know which installation class you want, read the following very carefully.
Note: In addition to the installation methods mentioned below, Red Hat Linux can also be installed "within" an already existing FAT (DOS/Windows) partition. This
Install Type
Install
Workstation
Server System
Custom System
Upgrade
Hide Help
Release Notes
Back
Next

A.3 Upgrading Your Filesystem

The installation program has detected the ext2 filesystem on your Red Hat Linux system. At this time you can choose to retain your current ext2 filesystem or migrate to the ext3 filesystem.

It is recommended, but not required, that you choose to migrate to the ext3 filesystem.

If you choose to migrate to the ext3 filesystem, existing system data will not be modified.

The following is a brief description of the ext2 and ext3 filesystems, and how they can be utilized.

- **ext2** — An ext2 filesystem supports standard Unix file types (regular files, directories, symbolic links, etc). It provides the ability to assign long file names, up to 255 characters. Versions prior to Red Hat Linux 7.2 used ext2 filesystems by default.
- **ext3** — The ext3 filesystem is based on the ext2 filesystem and has one main advantage — journaling. Using a journaling filesystem reduces time spent recovering a filesystem after a crash as there is no need to fsck[1]the filesystem.

1 The fsck application is used to check and optionally repair one or more Linux filesystems.

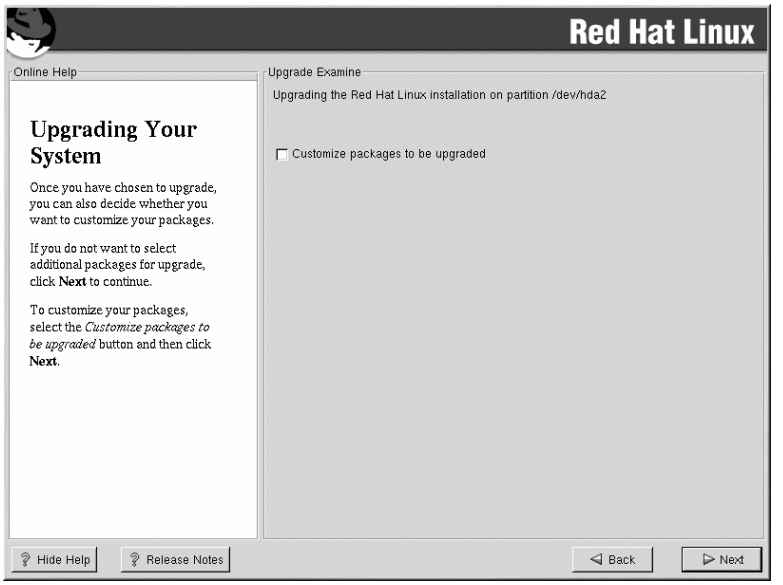
A.4 Customizing Your Upgrade

Do you want to choose the packages to be upgraded or let the installation program perform an automated installation (see Figure A–2, *Upgrade Customization*)?

To let the installation program begin the upgrade process for you, make sure **Customize packages to be upgraded** is *not* selected and click **Next** (see Section A.6, *Upgrading Packages*).

To customize your upgrade packages, select this option and then click **Next**.

Figure A–2 Upgrade Customization


Red Hat Linux
Online Help
Upgrading Your System
Once you have chosen to upgrade, you can also decide whether you want to customize your packages.
If you do not want to select additional packages for upgrade, click Next to continue.
To customize your packages, select the Customize packages to be upgraded button and then click Next.
Upgrade Examine
Upgrading the Red Hat Linux installation on partition /dev/hda2
Customize packages to be upgraded
Hide Help
Release Notes
Back
Next

A.5 Selecting Packages to Upgrade

On this screen, you can choose which packages you would like to upgrade (see Figure A–3, *Individual Package Selection*).

You can choose to view the individual packages in **tree view** or **flat view**.

Tree view allows you to see the packages grouped by application type.

Flat view allows you to see all of the packages in an alphabetical listing on the right of the screen.

Using **Tree view**, you see a listing of package groups. When you expand this list and pick one group, the list of packages in that group appears in the panel on the right.

To sort alphabetically, click on the **Package** tab. To sort packages by size, click on the **Size (MB)** tab.

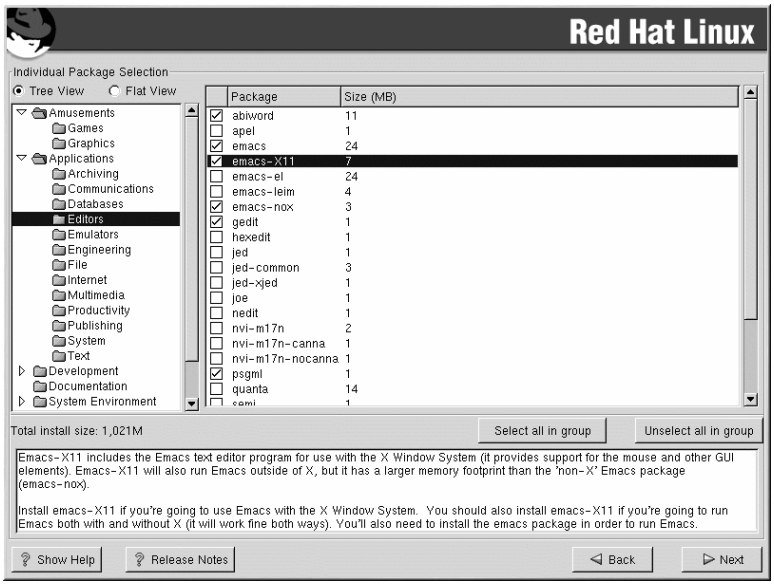
To select an individual package, double-click the checkbox beside the package name. A check mark in the box means that a package has been selected.

For more information about a specific package, click on the individual package name. The package information will appear at the bottom of the screen.

You can also select or deselect all packages listed within a particular group, by clicking on the **Select all in group** or **Unselect all in group** buttons.

Certain packages (for example, the kernel and certain libraries) are required for every Red Hat Linux system and are not available to select or deselect. These base packages are selected by default.

Figure A–3 Individual Package Selection

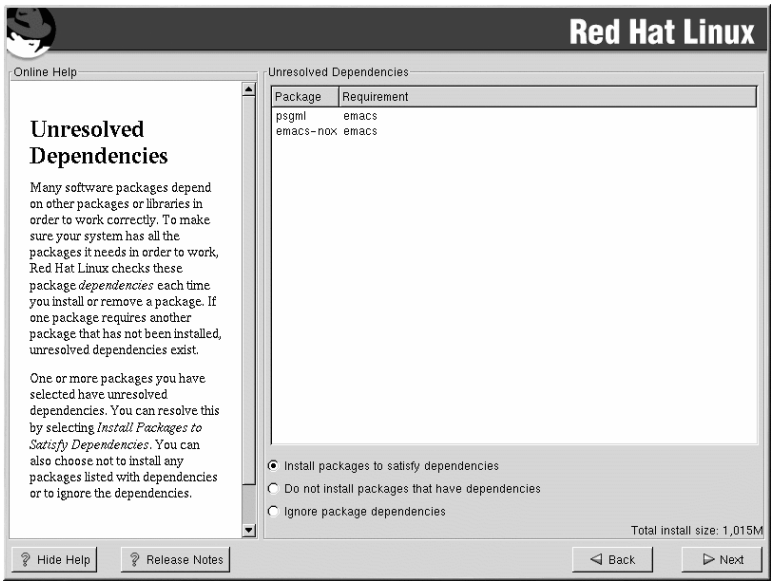


A.5.1 Unresolved Dependencies

If any package requires another package which you have not selected to install, the program presents a list of these **unresolved dependencies** and gives you the opportunity to resolve them (see Figure A–4, *Unresolved Dependencies*).

The **Unresolved Dependencies** screen appears only if you are missing packages that are needed by your customized package selection. At the bottom of the screen, under the list of missing packages, an **Install packages to satisfy dependencies** checkbox is selected by default. If you leave this checked, the installation program will resolve package dependencies automatically by adding all required packages to the list of selected packages.

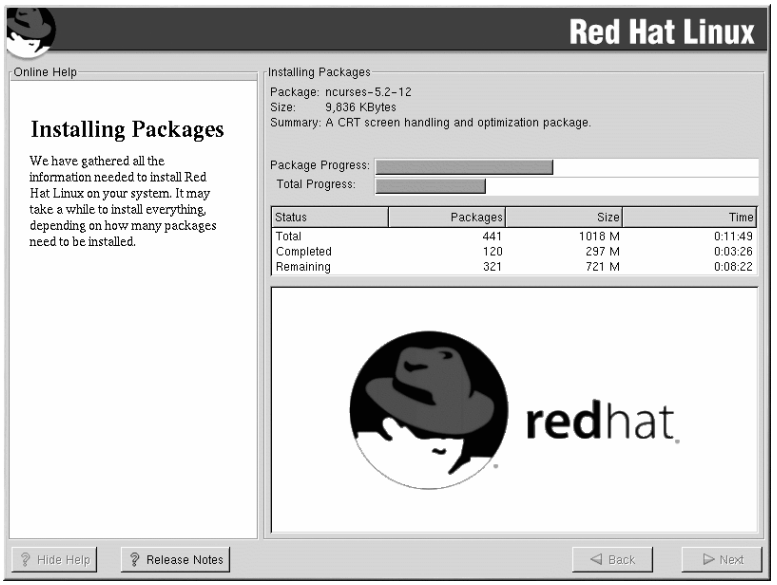
Figure A–4 Unresolved Dependencies


Red Hat Linux
Online Help
Unresolved Dependencies
Many software packages depend on other packages or libraries in order to work correctly. To make sure your system has all the packages it needs in order to work, Red Hat Linux checks these package dependencies each time you install or remove a package. If one package requires another package that has not been installed, unresolved dependencies exist.
One or more packages you have selected have unresolved dependencies. You can resolve this by selecting Install Packages to Satisfy Dependencies. You can also choose not to install any packages listed with dependencies or to ignore the dependencies.
Unresolved Dependencies
Package
Requirement
psgml emacs
emacs-nox emacs
Install packages to satisfy dependencies
Do not install packages that have dependencies
Ignore package dependencies
Total install size: 1,015M
Hide Help
Release Notes
Back
Next

A.6 Upgrading Packages

At this point there is nothing left for you to do until all the packages have been upgraded or installed (see Figure A–5, *Installing Packages*).

Figure A–5 Installing Packages


Red Hat Linux
Online Help
Installing Packages
We have gathered all the information needed to install Red Hat Linux on your system. It may take a while to install everything, depending on how many packages need to be installed.
Installing Packages
Package: ncurses-5.2-12
Size: 9,836 KBytes
Summary: A CRT screen handling and optimization package.
Package Progress:
Total Progress:
Status Packages Size Time
Total 441 1018 M 0:11:49
Completed 120 297 M 0:03:26
Remaining 321 721 M 0:08:22
redhat
Hide Help
Release Notes
Back
Next

A.7 Upgrade Complete

Congratulations! Your Red Hat Linux 7.2 upgrade is now complete!

B Additional Resources about Itanium and Linux

Other reference materials, related to running Red Hat Linux on an Itanium system, are available on the Web. A few of the available resources are as follows:

- http://www.linuxia64.org — *The Official Home Page of the Itanium Linux Project*
- http://developer.intel.com/software/idap/processor/itanium/ — The Intel website on the Itanium Processor
- http://developer.intel.com/software/idap/tech/video/efi/efi_shell_2.htm — Navigating through the EFI Shell Primer by Intel
- http://www.itanium.com/eBusiness/products/itanium/ — The Intel website on the Itanium processor family
- http://www.alphaworks.ibm.com/tech/linuxsdk — IBM Developer Kit for Linux on Itanium, Java 2 Technology Edition

C Getting Technical Support

C.1 Remember to Sign Up

If you have an official edition of Red Hat Linux 7.2 and/or an official Red Hat OEM partner kit, please remember to sign up for the benefits you are entitled to as a Red Hat customer.

You will be entitled to any or all of the following benefits, depending upon the Official Red Hat Linux product you purchased:

- Official Red Hat support — Get help with your installation questions from Red Hat, Inc.'s support team.
- Red Hat Network — Easily update your packages and receive security notices that are customized for your system. Go to http://rhn.redhat.com for details.
- Under the Brim: The Official Red Hat E-Newsletter — Every month, get the latest news and product information directly from Red Hat.

To sign up, go to http://www.redhat.com/apps/activate/. You will find your **Product ID** on the Registration Information Card in your Official Red Hat Linux boxed set.

C.2 An Overview of Red Hat Support

Note

Refer to the service level agreement at http://www.redhat.com/support/sla/ for more information on how Red Hat's technical support staff can assist you.

Red Hat provides installation assistance for Official Red Hat Linux boxed set products and covers installation on a single computer. This assistance is intended to help customers successfully install Red Hat Linux. Assistance with installation is offered via telephone and the Web. Note, telephone support is only available with certain Red Hat Linux products. Please check your boxed set to see what types of support are available to you.

Red Hat Support will attempt to answer any questions you may have before the installation process is initiated. This includes the following:

- Hardware compatibility questions
- Basic hard drive partitioning strategies

Red Hat, Inc. Support can also provide assistance during the installation process:

- Getting supported hardware recognized by the Red Hat Linux operating system
- Assistance with drive partitioning

We can also help you with basic post-installation tasks, such as:

- Successfully configuring the X Window System using Xconfigurator
- Configuring a local parallel port printer to print text
- Configuring a mouse

Our installation assistance service is designed to get Red Hat Linux running on your system as quickly and as easily as possible. However, there are many other things that you may want to do with your Red Hat Linux system, from compiling a custom kernel to setting up a Web server, which are not covered.

For assistance with these tasks, there is a wealth of online information available in the form of HOWTO documents, Linux-related websites, and commercial publications. The various Linux HOWTO documents are included with Red Hat Linux on the Documentation CD in the `/HOWTOS` directory. These HOWTOS are provided in text files that can easily be read from within Red Hat Linux and other operating systems.

A large number of Linux-related websites are available. The best starting point for finding information on Red Hat Linux is the Red Hat, Inc. website:

```
http://www.redhat.com/
```

Many Linux-related books are available. If you are new to Linux, a book that covers Linux basics will be invaluable. We can recommend several titles: The *Official Red Hat Linux Getting Started Guide*; *Using Linux*, by Bill Ball; *Linux Clearly Explained*, by Bryan Pfaffenberger; *Linux for Dummies*, by Jon "maddog" Hall; and *Learning Red Hat Linux*, by Bill McCarty.

Red Hat also offers various incident-based support plans to assist with configuration issues and tasks that are not covered by installation assistance. Please see the Red Hat Support website for more information. The Red Hat technical support website is located at the following URL:

```
http://www.redhat.com/support/
```

C.3 Scope of Red Hat Support

Red Hat, Inc. can only provide installation assistance to customers who have purchased an Official Red Hat Linux boxed set and/or an official Red Hat OEM partner kit. If you have obtained Linux from any other company, you must contact that company for support. Other companies include:

- Macmillan
- Sams/Que
- Linux Systems Labs (LSL)

- Mandrake
- CheapBytes

Additionally, Red Hat Linux obtained via any of the following methods does not qualify for support from Red Hat:

- Red Hat Linux PowerTools Archive
- Downloaded via FTP on the Internet
- Included in a package such as Motif or Applixware
- Copied or installed from another user's CD
- A CD-ROM (or CD-ROM set) included in a Linux book or other publication.

C.4 How to Get Technical Support

In order to receive technical support for your Official Red Hat product, you must register your product on Red Hat's website.

Every Official Red Hat product comes with a Product Identification code: a 16-character alphanumeric string. The Product ID for Red Hat Linux 7.2 is located on the Registration Information Card that can be found inside the box. Your Product ID is included in your boxed set, and you should keep it in a safe place. You need this code, so do not lose the card!

Note

Do not throw away the card with your Product ID. You need the Product ID to get technical support. If you lose the certificate, you may not be able to receive support.

The Product ID is the code that will enable your technical support and any other benefits or services that you purchased from Red Hat, depending upon which Red Hat product you purchased.

C.4.1 Signing up for Technical Support

To sign up for technical support, you will need to:

1. Create a customer profile at http://www.redhat.com/apps/activate/. You may have already completed this step; if you have, continue to the next step. If you do not already have a customer profile on the Red Hat website, please create a new one.
2. Using the login name and password you created during the customer profile, please log in at the Red Hat Support website at http://www.redhat.com/support.

If you created a new customer profile, once you activate your product you will see a webpage that shows your registered products. There is also a button, **Access Web Support**, on this page that will take you to the support website.

3. Update your contact information if necessary.

> **Note**
>
> If your email address is not correct, communications regarding your technical support requests CANNOT be delivered to you, and you will not be able to retrieve your login and password by email. Be sure that you give us your correct email address.

If you are worried about your privacy, please see Red Hat's privacy statement at http://www.redhat.com/legal/privacy_statement.html.

4. Add a product to your profile. Please enter the following information:
   - The Product ID for your boxed set product
   - The Support Certificate Number or Entitlement Number if the product is a contract
5. Set your customer preferences.
6. Answer the optional customer questionnaire.
7. Submit the form.

If the previous steps were completed successfully, you can now login at http://www.redhat.com/support and open a new technical service request. However, you must still use your Product ID in order to obtain technical support via telephone (if the product you purchased came with phone support). You will also be asked for your login name when contacting the technical support team via telephone.

C.5 Questions for Technical Support

Technical support is both a science and a mystical art form. In most cases, support technicians must rely on customer observations and communications with the customer in order to diagnose and solve the problem. Therefore, it is extremely important that you are as detailed and clear as possible when you state your questions and report your problems. Examples of what you should include are:

Note

Refer to the service level agreement at http://www.redhat.com/support/sla/ for more information on how Red Hat's technical support staff can assist you.

- Symptoms of the problem (for example: "Linux is not able to access my CD-ROM drive. When it tries, I get timeout errors.")
- When the problem began (for example: "My system was working fine until yesterday, when a lightning storm hit my area.")
- Any changes you made to your system (for example: "I added a new hard drive and used Partition Wizzo to add Linux partitions.")
- Other information that may be relevant to your situation, such as the installation method (CD-ROM, NFS, HTTP)
- Specific hardware devices that may be relevant to your problem (for example: If you cannot setup networking, what kind of network card do you have?)

C.5.1 How to Send Support Questions

Please login at http://www.redhat.com/support and open a new service request, or call the phone number for support. If your product came with phone support, or you have purchased a phone support contract, the phone number you will need to call will be provided to you during the sign up process.

For more information on using Red Hat's online support system go to http://www.redhat.com/support/services/access.html.

D Troubleshooting Your Installation of Red Hat Linux

This appendix discusses some common installation problems and their solutions.

D.1 You are Unable to Boot Red Hat Linux

D.1.1 Is Your System Displaying Signal 11 Errors?

If you receive a fatal signal 11 during your installation, it is probably due to a hardware error in memory on your system's bus. A hardware error in memory can be caused by problems in executables or with the system's hardware. Like other operating systems, Red Hat Linux places its own demands on your system's hardware. Some of this hardware may not be able to meet those demands, even if they work properly under another OS.

Check to see if you have the latest installation and supplemental boot diskettes from Red Hat. Review the online errata to see if newer versions are available. If the latest images still fail, it may be due to a problem with your hardware. Commonly, these errors are in your memory or CPU-cache. A possible solution for this error is turning off the CPU-cache in the BIOS. You could also try to swap your memory around in the motherboard slots to see if the problem is either slot or memory related.

For more information concerning signal 11 errors, refer to http://www.bitwizard.nl/sig11/.

D.1.2 Are You Unable to Boot from a Network Boot Disk?

If you are experiencing difficulties in getting the network boot disk you made to boot your system correctly, you may need an updated boot disk.

Check the online errata for updated diskette images (if available) and follow the instructions provided to make an updated boot disk for your system.

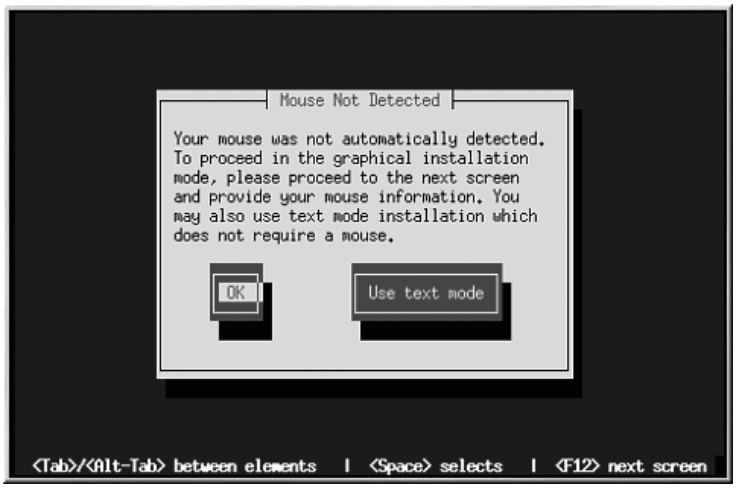
D.2 Trouble Beginning the Installation

D.2.1 Is Your Mouse Not Detected?

If the **Mouse Not Detected** screen (see Figure D–1, *Mouse Not Detected*) appears, then the installation program was not able to identify your mouse correctly.

You can choose to continue with the GUI installation or use the text mode installation, which does not require using a mouse. If you choose to continue with the GUI installation, you will need to provide the installation program with your mouse configuration information (see Figure 3–3, *Mouse Configuration*).

Figure D–1 Mouse Not Detected


Mouse Not Detected
Your mouse was not automatically detected. To proceed in the graphical installation mode, please proceed to the next screen and provide your mouse information. You may also use text mode installation which does not require a mouse.
OK
Use text mode
<Tab>/<Alt-Tab> between elements | <Space> selects | <F12> next screen

For an overview of text mode installation instructions, please refer to Chapter 4, *Installing Red Hat Linux via Text Mode*.

D.2.2 Problems with Booting into the Graphical Installation

The Red Hat Linux installation program uses frame buffers by default. However, there are some video cards that will not work with this setting. The end result will be a problem booting into the graphical installation program.

The installation program will first try to run in frame buffer mode. If that fails, it will try to run in a lower resolution mode. If that still fails, the installation program will run in text mode.

Video cards that will not run at 800 x 600 resolution should type **lowres** at the `boot:` prompt to run the installation program in 640 x 480 resolution.

If this still does not work, you can run the installation program without frame buffers by typing **nofb** at the `boot:` prompt.

D.3 Trouble During the Installation

D.3.1 Partition Creation Problems

If you are having trouble creating a partition (for example, a root (`/`) partition), make sure you are setting its partition type to Linux Native.

D.3.2 Other Partitioning Problems

If you are using Disk Druid to create partitions, but cannot move to the next screen, you probably have not created all the partitions necessary for Disk Druid's dependencies to be satisfied.

You must have the following partitions as a bare minimum:

- A `/boot/efi` partition of type vfat
- A `/` (root) partition of type Linux native
- A <swap> partition of type Linux swap

Tip

When defining a partition's type as Linux swap, you do not have to assign it a mount point. Disk Druid automatically assigns the mount point for you.

D.3.3 Are You Seeing Python Errors?

During some upgrades or installations of Red Hat Linux, the installation program (also known as Anaconda) may fail with a Python or traceback error. This error may occur after the selection of individual packages or while trying to save the upgrade log in `/tmp`. The error may look similar to:

```
Traceback (innermost last):
   File "/var/tmp/anaconda-7.1//usr/lib/anaconda/iw/progress_gui.py",
line 20, in run
     rc = self.todo.doInstall ()
   File "/var/tmp/anaconda-7.1//usr/lib/anaconda/todo.py", line 1468, in
doInstall
     self.fstab.savePartitions ()
   File "fstab.py", line 221, in savePartitions
     sys.exit(0)
 SystemExit: 0

 Local variables in innermost frame:
 self: <fstab.GuiFstab instance at 8446fe0>
 sys: <module 'sys' (built-in)>

 ToDo object:
 (itodo
 ToDo
 p1
 (dp2
```

```
S'method'
p3
(iimage
CdromInstallMethod
p4
(dp5
S'progressWindow'
p6

<failed>
```

This error occurs in some systems where links to `/tmp` are symbolic to other locations or have been changed since creation. These symbolic or changed links are invalid during the installation process, so the installation program cannot write information and fails.

If you experience such an error, first try to download any available errata for Anaconda. Errata can be found at http://www.redhat.com/support/errata.

You can also search for bug reports related to this problem. To search Red Hat's bug tracking system, go to http://bugzilla.redhat.com/bugzilla.

Finally, if you are still facing problems related to this error, register your product and contact our support team. To register your product, go to http://www.redhat.com/apps/activate.

D.4 Problems After Installation

D.4.1 Problems with Server Installations and X

If you performed a server installation and you are having trouble getting X to start, you may not have installed the X Window System during your installation.

If you want the X Window System, you can perform an upgrade to install X. During the upgrade, select the X Window System packages, and choose GNOME, KDE, or both.

Alternatively, you can install the XFree86 RPMs. For more information, refer to http://www.redhat.com/support/docs/howto/XFree86-upgrade/XFree86-upgrade.html.

D.4.2 Problems When You Try to Log In

If you did not create a user account during the installation you will need to log in as root and use the password you assigned to root.

If you cannot remember your user account password, you must become root. To become root, type `su -` and enter your root password when prompted. Then, type `passwd <username>`. This allows you to enter a new password for the specified user account.

If you selected either the custom or workstation installation and do not see the graphical login screen, check your hardware for compatibility issues. The *Hardware Compatibility List* can be found at http://hardware.redhat.com.

D.4.3 Does Netscape Navigator Crash on JavaScript Pages?

If Netscape Navigator continuously crashes on pages that contain JavaScripts, you may need to edit your `~/.mailcap` file.

Edit the file using pico by typing `pico ~/.mailcap` at the prompt in a terminal window. (You may use any text editor.)

Remove the following lines from the file:

```
application/x-javascript;;\
x-mozilla-flags=save
```

You can also turn off JavaScript within Netscape Navigator itself. Click on **Edit**=>**Preferences**=>**Advanced** and make sure the **Enable JavaScript** checkbox is not selected.

If these do not help, you can also try to use a newer version of Netscape Navigator if available. Check the Red Hat Linux errata website under security advisories for more information.

D.4.4 Your Printer Will Not Work Under X

If you are not sure how to set up your printer or are having trouble getting it to work properly, try using the graphical printconf program. Log in as root, open a terminal window, and type `printconf-gui`.

D.4.5 Problems with Sound Configuration

If you do not have sound after your installation, you may need to run the sound configuration utility. As root, type `sndconfig` in a terminal window.

Note

`sndconfig` must be run in runlevel 3. More information about runlevels can be found in the *Official Red Hat Linux Reference Guide*, in chapter *Boot Process, Init, and Shutdown*.

If the sndconfig application does not help, you may need to select the `Enable sound server startup` option under the **Multimedia**=>**Sound** in the GNOME Control Center.

To do this, click on **Panel**=>**Programs**=>**Settings**=>**GNOME Control Center** to launch the GNOME Control Center. In the GNOME Control Center, select the **Sound** submenu of the **Multimedia** menu. On the right, a **General** sound menu will appear. Select `Enable sound server startup` and then click **OK**.

E An Introduction to Disk Partitions

Disk partitions are a standard part of the personal computer landscape and have been for quite some time. However, with many people purchasing computers featuring preinstalled operating systems, relatively few people understand how partitions work. This chapter attempts to explain the reasons for and use of disk partitions so your Red Hat Linux installation will be as simple and painless as possible.

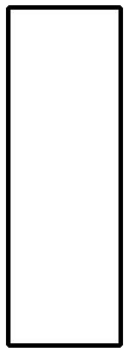
If you are reasonably comfortable with disk partitions, you could skip ahead to Section E.1.4, *Making Room For Red Hat Linux* for more information on the process of freeing up disk space to prepare for a Red Hat Linux installation. This section also discusses the partition naming scheme used by Linux systems, sharing disk space with other operating systems, and related topics.

E.1 Hard Disk Basic Concepts

Hard disks perform a very simple function — they store data and reliably retrieve it on command.

When discussing issues such as disk partitioning, it is important to know a bit about the underlying hardware. Unfortunately, it is easy to become bogged down in details. Therefore, we will use a simplified diagram of a disk drive to help explain what is really happening when a disk drive is partitioned. Figure E–1, *An Unused Disk Drive* shows a brand-new, unused disk drive.

Figure E–1 An Unused Disk Drive

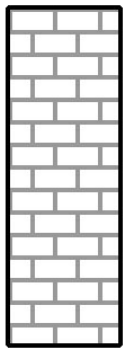


Not much to look at, is it? But if we are talking about disk drives on a basic level, it will do. Say that we would like to store some data on this drive. As things stand now, it will not work. There is something we need to do first…

E.1.1 It is Not What You Write, it is How You Write It

Experienced computer users probably got this one on the first try. We need to **format** the drive. Formatting (usually known as "making a **filesystem**") writes information to the drive, creating order out of the empty space in an unformatted drive.

Figure E–2 Disk Drive with a Filesystem



As Figure E–2, *Disk Drive with a Filesystem* implies, the order imposed by a filesystem involves some trade-offs:

- A small percentage of the drive's available space is used to store filesystem-related data and can be considered as overhead.
- A filesystem splits the remaining space into small, consistently-sized segments. For Linux, these segments are known as **blocks**. [1]

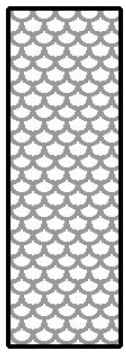
Given that filesystems make things like directories and files possible, these tradeoffs are usually seen as a small price to pay.

It is also worth noting that there is no single, universal filesystem. As Figure E–3, *Disk Drive with a Different Filesystem* shows, a disk drive may have one of many different filesystems written on it. As you might guess, different filesystems tend to be incompatible; that is, an operating system that supports one filesystem (or a handful of related filesystem types) may not support another. This last statement is not a hard-and-fast rule, however. For example, Red Hat Linux supports a wide variety

[1] Blocks really *are* consistently sized, unlike our illustrations. Keep in mind, also, that an average disk drive contains thousands of blocks. But for the purposes of this discussion, please ignore these minor discrepancies.

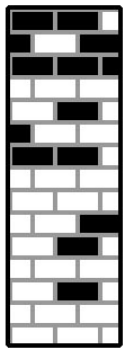
of filesystems (including many commonly used by other operating systems), making data interchange between different filesystems easy.

Figure E–3 Disk Drive with a Different Filesystem



Of course, writing a filesystem to disk is only the beginning. The goal of this process is to actually *store* and *retrieve* data. Let us take a look at our drive after some files have been written to it.

Figure E–4 Disk Drive with Data Written to It



As Figure E–4, *Disk Drive with Data Written to It* shows, 14 of the previously-empty blocks are now holding data. However, by simply looking at this picture, we cannot determine exactly how many files reside on this drive. There may be as few as one or as many as 14 files, as all files use at least one block and some files use multiple blocks. Another important point to note is that the used blocks do not have to form a contiguous region; used and unused blocks may be interspersed. This is known as **fragmentation**. Fragmentation can play a part when attempting to resize an existing partition.

As with most computer-related technologies, disk drives changed over time after their introduction. In particular, they got bigger. Not larger in physical size, but bigger in their capacity to store information. And, this additional capacity drove a fundamental change in the way disk drives were used.

E.1.2 Partitions: Turning One Drive Into Many

As disk drive capacities soared, some people began to wonder if having all of that formatted space in one big chunk was such a great idea. This line of thinking was driven by several issues, some philosophical, some technical. On the philosophical side, above a certain size, it seemed that the additional space provided by a larger drive created more clutter. On the technical side, some filesystems were never designed to support anything above a certain capacity. Or the filesystems *could* support larger

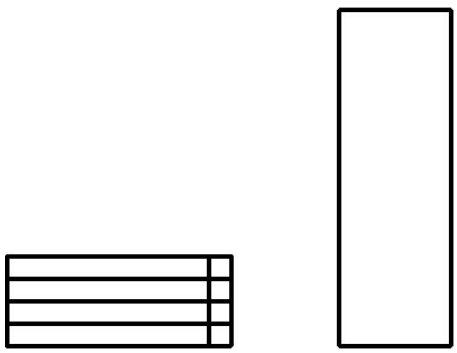
drives with a greater capacity, but the overhead imposed by the filesystem to track files became excessive.

The solution to this problem was to divide disks into **partitions**. Each partition can be accessed as if it was a separate disk. This is done through the addition of a **partition table**.

Note

While the diagrams in this chapter show the partition table as being separate from the actual disk drive, this is not entirely accurate. In reality, the partition table is stored at the very start of the disk, before any filesystem or user data. But for clarity, we will keep it separate in our diagrams.

Figure E–5 Disk Drive with Partition Table



As Figure E–5, *Disk Drive with Partition Table* shows, the partition table is divided into four sections. Each section can hold the information necessary to define a single partition, meaning that the partition table can define no more than four partitions.

Each partition table entry contains several important characteristics of the partition:

- The points on the disk where the partition starts and ends

- Whether the partition is "active"
- The partition's type

Let us take a closer look at each of these characteristics. The starting and ending points actually define the partition's size and location on the disk. The "active" flag is used by some operating systems' boot loaders. In other words, the operating system in the partition that is marked "active" will be booted.

The partition's type can be a bit confusing. The type is a number that identifies the partition's anticipated usage. If that statement sounds a bit vague, that is because the meaning of the partition type is a bit vague. Some operating systems use the partition type to denote a specific filesystem type, to flag the partition as being associated with a particular operating system, to indicate that the partition contains a bootable operating system, or some combination of the three.

Table E–1, *Partition Types* contains a listing of some popular (and obscure) partition types, along with their numeric values.

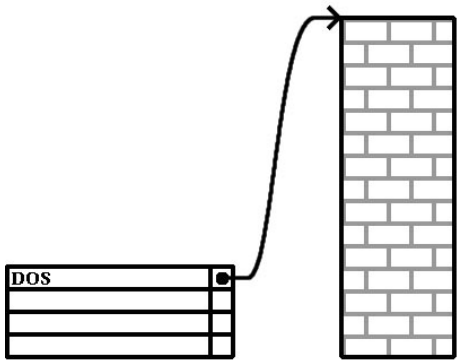
Table E–1 Partition Types

Partition Type	Value	Partition Type	Value
Empty	00	Novell Netware 386	65
DOS 12-bit FAT	01	PIC/IX	75
XENIX root	02	Old MINIX	80
XENIX usr	03	Linux/MINUX	81
DOS 16-bit <=32M	04	Linux swap	82
Extended	05	Linux native	83
DOS 16-bit >=32	06	Linux extended	85
OS/2 HPFS	07	Amoeba	93
AIX	08	Amoeba BBT	94
AIX bootable	09	BSD/386	a5
OS/2 Boot Manager	0a	OpenBSD	a6
Win95 FAT32	0b	NEXTSTEP	a7
Win95 FAT32 (LBA)	0c	BSDI fs	b7
Win95 FAT16 (LBA)	0e	BSDI swap	b8
Win95 Extended (LBA)	0f	Syrinx	c7

Partition Type	Value	Partition Type	Value
Venix 80286	40	CP/M	db
Novell	51	DOS access	e1
Microport	52	DOS R/O	e3
GNU HURD	63	DOS secondary	f2
Novell Netware 286	64	BBT	ff

By this point, you might be wondering how all this additional complexity is normally used. See Figure E–6, *Disk Drive With Single Partition* for an example.

Figure E–6 Disk Drive With Single Partition



In many cases, there is only a single partition spanning the entire disk, essentially duplicating the method used before partitions. The partition table has only one entry used, and it points to the start of the partition.

We have labeled this partition as being of the "DOS" type. Although it is only one of several possible partition types listed in Table E–1, *Partition Types*, it is adequate for the purposes of this discussion.

This is a typical partition layout for most newly purchased computers with a consumer version of Microsoft Windows™ preinstalled.

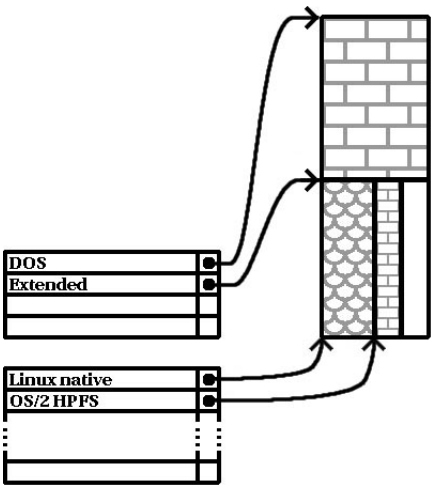
E.1.3 Partitions within Partitions – An Overview of Extended Partitions

Of course, over time it became obvious that four partitions would not be enough. As disk drives continued to grow, it became more and more likely that a person could configure four reasonably-sized partitions and still have disk space left over. There needed to be some way of creating more partitions.

Enter the extended partition. As you may have noticed in Table E–1, *Partition Types*, there is an "Extended" partition type. It is this partition type that is at the heart of extended partitions.

When a partition is created and its type is set to "Extended," an extended partition table is created. In essence, the extended partition is like a disk drive in its own right —— it has a partition table that points to one or more partitions (now called **logical partitions**, as opposed to the four **primary partitions**) contained entirely within the extended partition itself. Figure E–7, *Disk Drive With Extended Partition* shows a disk drive with one primary partition and one extended partition containing two logical partitions (along with some unpartitioned free space).

Figure E–7 Disk Drive With Extended Partition



As this figure implies, there is a difference between primary and logical partitions -- there can only be four primary partitions, but there is no fixed limit to the number of logical partitions that can exist. (However, in reality, it is probably not a good idea to try to define and use more than 12 logical partitions on a single disk drive.)

Now that we have discussed partitions in general, let us see how to use this knowledge to install Red Hat Linux.

E.1.4 Making Room For Red Hat Linux

There are three possible scenarios you may face when attempting to repartition your hard disk:

- Unpartitioned free space is available
- An unused partition is available
- Free space in an actively used partition is available

Let's look at each scenario in order.

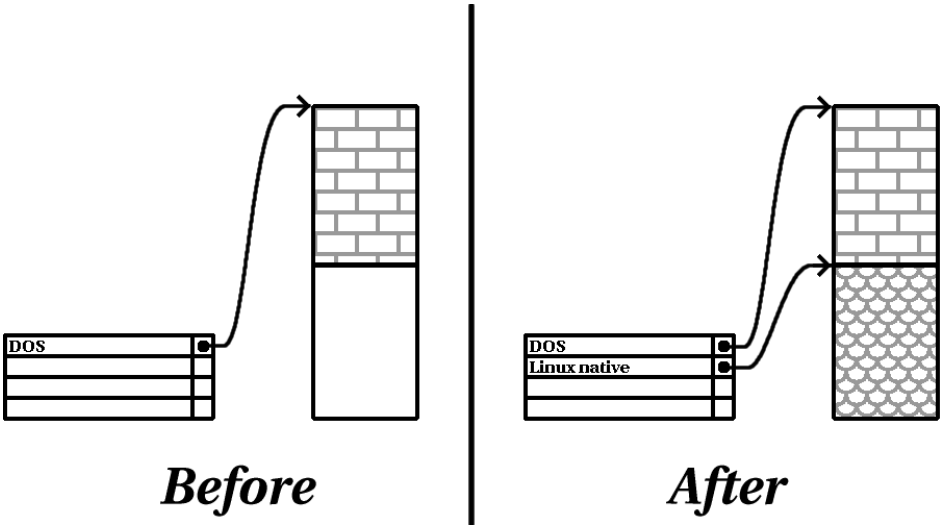
Note

Please keep in mind that the following illustrations are simplified in the interest of clarity and do not reflect the exact partition layout that you will encounter when actually installing Red Hat Linux.

Using Unpartitioned Free Space

In this situation, the partitions already defined do not span the entire hard disk, leaving unallocated space that is not part of any defined partition. Figure E–8, *Disk Drive with Unpartitioned Free Space* shows what this might look like.

Figure E–8 Disk Drive with Unpartitioned Free Space



If you think about it, an unused hard disk also falls into this category. The only difference is that *all* the space is not part of any defined partition.

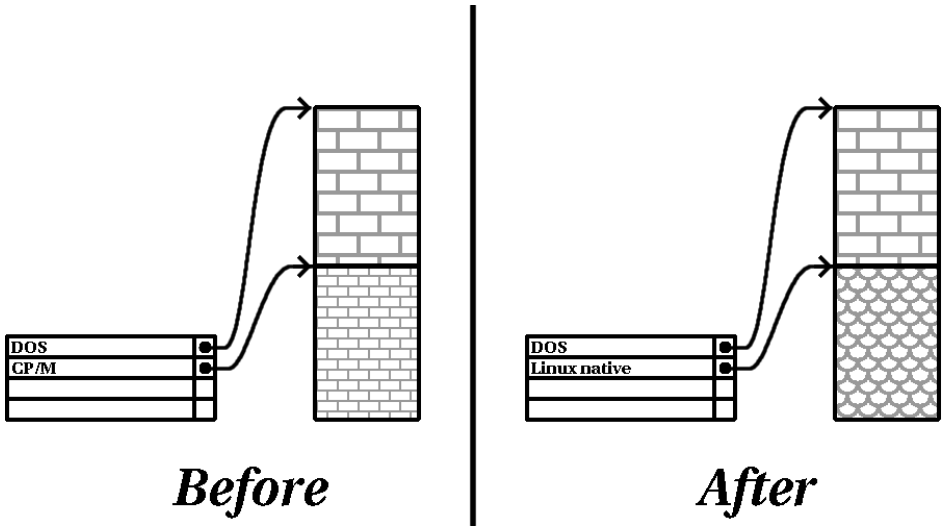
In any case, you can simply create the necessary partitions from the unused space. Unfortunately, this scenario, although very simple, is not very likely (unless you have just purchased a new disk just for Red Hat Linux). Most pre-installed operating systems are configured to take up all available space on a disk drive (see *Using Free Space from an Active Partition* in Section E.1.4).

Let's move on to a slightly more common situation.

Using Space from an Unused Partition

In this case, maybe you have one or more partitions that you do not use any longer. Perhaps you have dabbled with another operating system in the past, and the partition(s) you dedicated to it never seem to be used anymore. Figure E–9, *Disk Drive With an Unused Partition* illustrates such a situation.

Figure E–9 Disk Drive With an Unused Partition



If you find yourself in this situation, you can use the space allocated to the unused partition. You will first need to delete the partition, and then create the appropriate Linux partition(s) in its place. You can either delete the partition using the DOS `fdisk` command, or you will be given the opportunity to do so during a custom installation.

Using Free Space from an Active Partition

This is the most common situation. It is also, unfortunately, the hardest to handle. The main problem is that, even if you have enough free space, it is presently allocated to a partition that is already in use. If you purchased a computer with pre-installed software, the hard disk most likely has one massive partition holding the operating system and data.

Aside from adding a new hard drive to your system, you have two choices:

Destructive Repartitioning

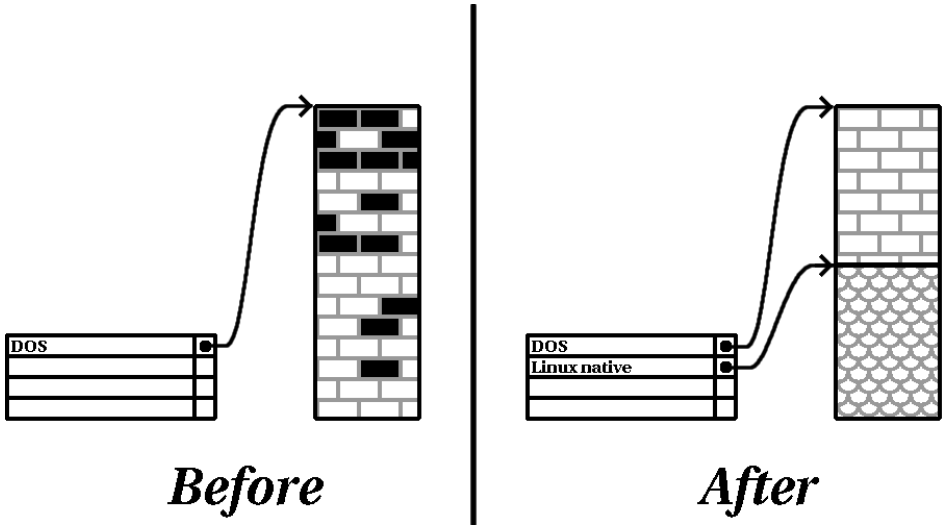
> Basically, you delete the single large partition and create several smaller ones. As you might imagine, any data you had in the original partition is destroyed. This means that making a complete backup is necessary. For your own sake, make two backups, use verification (if available in your backup software), and try to read data from your backup *before* you delete the partition.

CAUTION

If there was an operating system of some type installed on that partition, it will need to be reinstalled as well. Be aware that some computers sold with pre-installed operating systems may not include the CD-ROM media to reinstall the original operating system. The best time to notice if this applies to your system is *before* you destroy your original partition and its operating system installation.

After creating a smaller partition for your existing software, you can reinstall any software, restore your data, and continue your Red Hat Linux installation. Figure E–10, *Disk Drive Being Destructively Repartitioned* shows this being done.

Figure E–10 Disk Drive Being Destructively Repartitioned



As Figure E–10, *Disk Drive Being Destructively Repartitioned* shows, any data present in the original partition will be lost without proper backup!

Non-Destructive Repartitioning

Here, you run a program that does the seemingly impossible: it makes a big partition smaller without losing any of the files stored in that partition. Many people have found this method to be reliable and trouble-free. What software should you use to perform this feat? There are several disk management software products on the market. You will have to do some research to find the one that is best for your situation.

While the process of non-destructive repartitioning is rather straightforward, there are a number of steps involved:

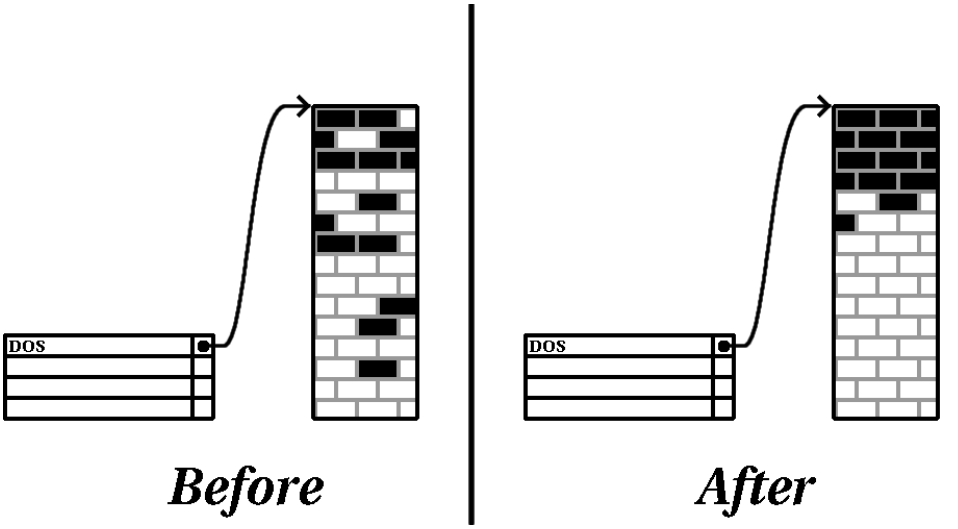
- Compress existing data
- Resize the existing partition
- Create new partition(s)

Let’s take a look at each step in a bit more detail.

Compress existing data

As Figure E–11, *Disk Drive Being Compressed* shows, the first step is to compress the data in your existing partition. The reason for doing this is to rearrange the data such that it maximizes the available free space at the "end" of the partition.

Figure E–11 Disk Drive Being Compressed

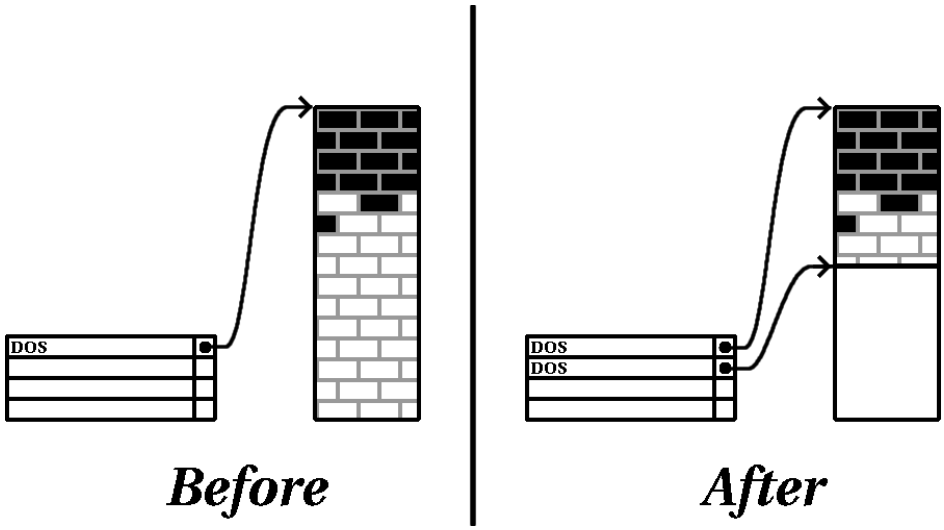


This step is crucial. Without it, the location of your data could prevent the partition from being resized to the extent desired. Note also that, for one reason or another, some data cannot be moved. If this is the case (and it severely restricts the size of your new partition(s)), you may be forced to destructively repartition your disk.

Resize the existing partition

Figure E–12, *Disk Drive with Partition Resized* shows the actual resizing process. While the actual result of the resizing operation varies depending on the software used, in most cases the newly freed space is used to create an unformatted partition of the same type as the original partition.

Figure E–12 Disk Drive with Partition Resized

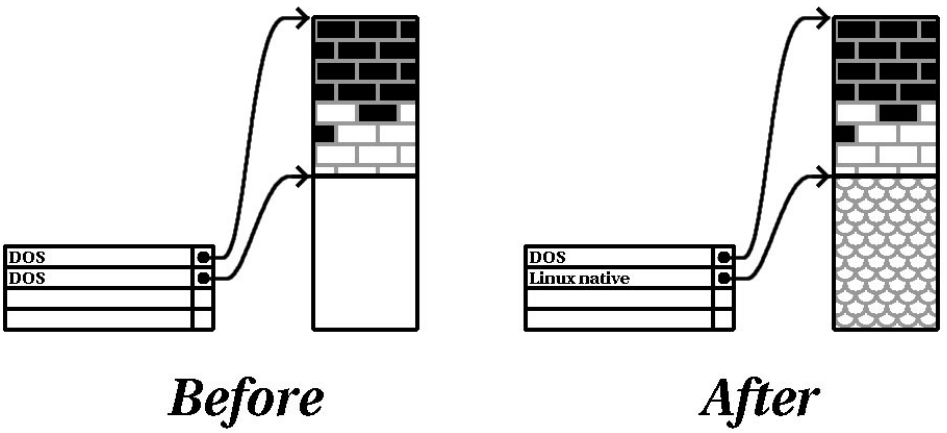


It is important to understand what the resizing software you use does with the newly freed space, so that you can take the appropriate steps. In the case we have illustrated, it would be best to simply delete the new DOS partition, and create the appropriate Linux partition(s).

Create new partition(s)

As the previous step implied, it may or may not be necessary to create new partitions. However, unless your resizing software is Linux-aware, it is likely you will need to delete the partition that was created during the resizing process. Figure E–13, *Disk Drive with Final Partition Configuration* shows this being done.

Figure E–13 Disk Drive with Final Partition Configuration



Note

The following information is specific to Intel-based computers only.

As a convenience to Red Hat Linux users, the DOS `fips` utility is included on the Red Hat Linux/Itanium CD 1 in the `dosutils` directory. This is a freely available program that can resize FAT (File Allocation Table) partitions.

WARNING

Many people have successfully used `fips` to resize their hard drive partitions. However, because of the nature of the operations carried out by `fips` and the wide variety of hardware and software configurations under which it must run, Red Hat cannot guarantee that `fips` will work properly on your system. Therefore, no installation support is available for `fips`. *Use it at your own risk.*

That said, if you decide to repartition your hard drive with `fips`, it is *vital* that you do two things:

- *Perform a backup* — Make two copies of all the important data on your computer. These copies should be to removable media (such as tape or diskettes), and you should make sure they are readable before proceeding.
- *Read the documentation* — Completely read the `fips` documentation, located in the `dosutils/fipsdocs` subdirectory on Red Hat Linux/Itanium CD 1.

Should you decide to use `fips`, be aware that after `fips` runs you will be left with *two* partitions: the one you resized, and the one `fips` created out of the newly freed space. If your goal is to use that space to install Red Hat Linux, you should delete the newly created partition, either by using `fdisk` under your current operating system or while setting up partitions during a custom installation.

E.1.5 Partition Naming Scheme

Linux refers to disk partitions using a combination of letters and numbers which may be confusing, particularly if you are used to the "C drive" way of referring to hard disks and their partitions. In the DOS/Windows world, partitions are named using the following method:

- Each partition's type is checked to determine if it can be read by DOS/Windows.
- If the partition's type is compatible, it is assigned a "drive letter." The drive letters start with a "C" and move on to the following letters, depending on the number of partitions to be labeled.
- The drive letter can then be used to refer to that partition as well as the filesystem contained on that partition.

Red Hat Linux uses a naming scheme that is more flexible and conveys more information than the approach used by other operating systems. The naming scheme is file-based, with filenames in the form:

`/dev/xxyN`

Here is how to decipher the partition naming scheme:

`/dev/`

This string is the name of the directory in which all device files reside. Since partitions reside on hard disks, and hard disks are devices, the files representing all possible partitions reside in `/dev/`.

xx

The first two letters of the partition name indicate the type of device on which the partition resides. You will normally see either `hd` (for IDE disks) or `sd` (for SCSI disks).

y

This letter indicates which device the partition is on. For example, `/dev/hda` (the first IDE hard disk) or `/dev/sdb` (the second SCSI disk).

N

The final number denotes the partition. The first four (primary or extended) partitions are numbered `1` through `4`. Logical partitions start at `5`. So, for example, `/dev/hda3` is the third primary or extended partition on the first IDE hard disk, and `/dev/sdb6` is the second logical partition on the second SCSI hard disk.

Note

There is no part of this naming convention that is based on partition type; unlike DOS/Windows, *all* partitions can be identified under Red Hat Linux. Of course, this does not mean that Red Hat Linux can access data on every type of partition, but in many cases it is possible to access data on a partition dedicated to another operating system.

Keep this information in mind; it will make things easier to understand when you are setting up the partitions Red Hat Linux requires.

E.1.6 Disk Partitions and Other Operating Systems

If your Red Hat Linux partitions will be sharing a hard disk with partitions used by other operating systems, most of the time you will have no problems. However, there are certain combinations of Linux and other operating systems that require extra care. Information on creating disk partitions compatible with other operating systems is available in several HOWTOs and Mini-HOWTOs, available on the Red Hat Linux Documentation CD in the `HOWTO` and `HOWTO/mini` directories. In particular, the Mini-HOWTOs whose names start with `Linux+` are quite helpful.

E.1.7 Disk Partitions and Mount Points

One area that many people new to Linux find confusing is the matter of how partitions are used and accessed by the Linux operating system. In DOS/Windows, it is relatively simple: Each partition gets a "drive letter." You then use the correct drive letter to refer to files and directories on its corresponding partition.

This is entirely different from how Linux deals with partitions and, for that matter, with disk storage in general. The main difference is that each partition is used to form part of the storage necessary to support a single set of files and directories. This is done by associating a partition with a directory through a process known as **mounting**. Mounting a partition makes its storage available starting at the specified directory (known as a **mount point**).

For example, if partition `/dev/hda5` were mounted on `/usr`, that would mean that all files and directories under `/usr` would physically reside on `/dev/hda5`. So the file `/usr/share/doc/FAQ/txt/Linux-FAQ` would be stored on `/dev/hda5`, while the file `/etc/X11/gdm/Sessions/Gnome` would not.

Continuing our example, it is also possible that one or more directories below `/usr` would be mount points for other partitions. For instance, a partition (say, `/dev/hda7`) could be mounted on `/usr/local`, meaning that `/usr/local/man/whatis` would then reside on `/dev/hda7` rather than `/dev/hda5`.

E.1.8 How Many Partitions?

At this point in the process of preparing to install Red Hat Linux, you will need to give some consideration to the number and size of the partitions to be used by your new operating system. The question of "how many partitions" continues to spark debate within the Linux community and, without any end to the debate in sight, it is safe to say that there are probably as many partition layouts as there are people debating the issue.

Keeping this in mind, we recommend that, unless you have a reason for doing otherwise, you should at least create the following partitions:

- *A swap partition* — Swap partitions are used to support virtual memory. In other words, data is written to swap when there is not RAM to hold the data your system is processing. You *must* create a swap partition to correctly use Red Hat Linux. The minimum size of your swap partition should be equal to twice the amount of your computer's RAM or 32 MB, whichever is larger.
- *A `/boot/efi` partition* — The partition mounted on `/boot/efi` contains the operating system kernel (which allows your system to boot Red Hat Linux), the configuration files for ELILO, and a few other files used during the bootstrap process. This partition must be formatted as type DOS.
- *A root partition (`/`)* — The root partition is where `/` (the root directory) resides. In this partitioning layout, all files (except those stored in `/boot/efi`) reside on the root partition. Because of this, it is in your best interest to maximize the size of your root partition. A 1.2 GB root partition will permit the equivalent of a workstation installation (with *very* little free space), while a 3.4 GB root partition will let you install every package. Obviously, the more space you can give the root partition, the better.

Specific recommendations concerning the proper size for various Red Hat Linux partitions can be found in Section 1.4, *Which Installation Class is Best For You?*.

Index

A

adding partitions 37
  filesystem type 39
authentication
  configuration 51
    Kerberos 51
    LDAP 51
    MD5 passwords 51
    NIS 51
    shadow passwords..... 51
autoboot..... 71
  ELILO 65
automatic partitioning 32–33

B

boot diskette
  creating from boot image file 23
`/boot/efi` 37
`boot.img`..... 24
bootable CD-ROM..... 71
booting
  from a CD-ROM 23
  installation program
    from a CD-ROM 23
    from an LS-120 diskette 23

C

CD-ROM
  bootable..... 71
class
  installation..... 31
clock 47
configuration
  clock 47
  hardware 68
  network 42
  time..... 47
  time zone 47
  video 68
consoles, virtual..... 25

D

deleting partitions..... 40
dependencies
  installing packages..... 56
  upgrading packages..... 82
Disk Druid
  adding partitions 37
    filesystem type 39
  buttons 36
  deleting partitions..... 40
  editing partitions 40
  partitions..... 34
disk partitioning..... 32
disk space..... 14
disk space requirements 15, 21
  custom 18
  server..... 17
  workstation 16
documentation
  other manuals..... 13

E

editing partitions..... 40
EFI
  system partition 23
EFI Shell..... 21
ELILO
  autoboot..... 65
  post-installation boot setup..... 64
extended partitions.....107

F

fdisk..... 40

filesystem
formats, overview of 100
filesystem migration
upgrading your filesystem 80
filesystem types 39, 80
fips partitioning utility 115
FTP
installation 76

H

hard disk
basic concepts 99
extended partitions 107
filesystem formats 100
partition introduction 103
partition types 105
partitioning of 99
hard drive install 73
hardware
compatibility 14
configuration 68
hostname configuration 43
HTTP
installation 78

I

ia64
(See Itanium)
information
network 68
pre-installation 67
installation
booting without diskette 71
choosing 15
class 31
custom 18
disk space 14
FTP 76
getting Red Hat Linux 13
GUI
CD-ROM 25
hard drive 73
HTTP 78
Itanium overview 21
keyboard navigation 71
method
CD-ROM 26
FTP 27
hard drive 26
HTTP 27
NFS image 26
selecting 26
network 74
NFS 75
NFS server information 76
no boxed set 14
partitioning 34
program
text mode user interface 69
user interface 25
virtual consoles 25
registering your product 14
server 17
text mode 67, 71
cross-reference table 72
online help 72
user interface 69
upgrading 19
workstation 16
installation class
choosing 15
installation overview 21
installing packages 53

K

keyboard
configuration 28
navigating the installation program
using 71
keymap

selecting type of keyboard 28

L

language
selecting 27
support for multiple languages..... 46

M

manuals 13
mount points
partitions and 117
mouse
configuring 29
not detected..... 93
selecting 29

N

network
configuration 42
information 68
installations
FTP 76
HTTP..... 78
network install 74
NFS
installation 75

O

online help
hiding 31
text mode installation 72

P

packages
groups 53
selecting..... 53
individual 55
installing 53
selecting 53
partition
`/boot/efi` 118
extended 107
root 118
swap 118
partitioning 34
automatic 32–33
basic concepts 99
creating new 37
filesystem type 39
destructive 110
extended partitions 107
how many partitions 118
introduction to..... 103
making room for partitions..... 108
mount points and..... 117
naming partitions..... 116
non-destructive 112
numbering partitions..... 116
other operating systems..... 117
recommended 37
types of partitions 105
using free space 108
using in-use partition 110
using unused partition 109
with fdisk 40
password
setting root..... 49
user accounts 50
post-installation setup 64
pre-installation information 67

R

RAM requirements 21
recursion
(See recursion)
registering your product 14
root / partition 37
root partition

(See partition, root)
root password 49

S

selecting
packages 53
starting
installation 71
startup.nsh 66
steps
choosing an installation class 15
disk space 14
hardware compatibility 14
Red Hat Linux components 13
support, technical
(See technical support)
swap 37
custom auto-partition 19
workstation auto-partition 17
swap partition
(See partition, swap)
System Partition 23

T

tables
text mode cross-reference 72
technical support 87
how to send questions for 91
how to state problems for 90
not provided for other companies' products 88
policy overview 87
registering online 89
signing up for 89
text mode installation
cross-reference table 72
time zone
configuration 47
troubleshooting 93
after the installation 96
logging in 96
Netscape Navigator 97
printers and X 97
server installations and X 96
sound configuration 97
beginning the installation 93
GUI installation method unavailable . 94
mouse not detected 93
booting 93
network boot disk 93
signal 11 error 93
during the installation 94
completing partitions 95
creating partitions 94
Python errors 95

U

unresolved dependencies
full installation 56
upgrade 82
upgrade 19, 79
customizing 81
description of 79
ext2 80
ext3 80
filesystem 80
package selection 81
packages 81
starting 79
unresolved dependencies 82
user accounts
creation 50
setting up 50
user interface
installation program 25
text mode installation 69

V

video configuration 68

virtual consoles 25

X

X
  configuration 57
X Window System 57
Xconfigurator
  monitor setup 61
  video card setup 57